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8

BASED ON WINDOWS 10 with MS Office 2016

Think Digitally

On a technology Trek...

Teachers' Digital Support
Teachers' Manuals
App

NEP Compliant

TEST PAPERS | WORKSHEETS | PROJECT | SAMPLE PAPER | 21ST CENTURY SKILLS
360 DEGREE HOLISTIC PROGRESS CARD | EXPERIENTIAL LEARNING | ART INTEGRATION

BASED ON WINDOWS 10 with MS Office 2016

8

Think Digitally

On a technology Trek...

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Eduline Publishers

National Education Policy 2020

NEP stand for **National Education Policy**. According to this policy, the curriculum at every level should focus holistic, integrated, enjoyable and engaging learning techniques. It is a historic step towards reforming and modernising our education system. Transformative changes have been recommended in the structure, progression, curriculum, assessment and pedagogy. The reconfiguration of school education structure will make it more responsive and relevant to learners' needs at different stages of their development. The policy focuses on skill-based learning. It believes that the purpose of education is to develop good human bring capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper and creative imagination with sound ethical values. It aims at producing engaged, productive, and contributing citizens for building an equitable, inclusive, and plural society as envisaged by our Constitution.

Eduline

HOW TO USE THE APP

STEP 1

Install the EDULINE DIGITAL APP from GOOGLE PLAY STORE.

STEP 2

Tap on the icon of the downloaded App to open it.

STEP 3

Tap on the ADD-ON button.

STEP 4

A QR CODE SCANNER screen appears.

STEP 5

Scan the QR CODE given in the book to download the content.

STEP 6

Tap on the name of this book from the list. Your book opens.

STEP 7

Watch the lessons on your mobile or tab.

QR CODE

This book is completely aligned with NEP **(National Education Policy) 2020**. It also includes 21st century skills to deal with different challenges.

Computational Thinking: This refers to the ability to solve problems by breaking them into smaller steps and using logical thinking and step-by-step instructions, often in the context of computer programming.

Information Literacy: Information literacy involves the skills to find, evaluate, and use information effectively and responsibly, particularly in the age of the internet and digital resources.

Collaboration: Collaboration is the practice of working together with others, sharing ideas, and combining efforts to achieve common goals or solve problems.

Critical Thinking: Critical thinking is the ability to analyse, evaluate, and solve problems by considering evidence, arguments, and various perspectives.

Art Integration: Art integration involves incorporating artistic elements, such as visual arts, music, or performance, into the learning process to enhance understanding and creativity.

Social interaction: Social interaction pertains to the ability to engage and communicate with others in a social setting, promoting collaboration, communication, and interpersonal skills.

Technology Literacy: Technology literacy refers to the understanding and competency in using various forms of technology, such as computers, software, and digital tools.

Communication: Communication involves the exchange of information, ideas, and thoughts between individuals or groups, whether through verbal, written, or digital means.

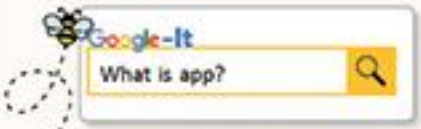
Creativity: Creativity refers to the ability to generate novel ideas, solutions, or expressions through imagination and innovation.

Life Skills & Values: Life skills encompass a range of abilities such as decision-making, problem-solving, and emotional intelligence. Values refer to the principles and beliefs that guide one's behavior and choices.

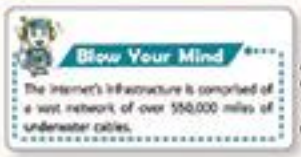
Experiential learning: Experiential learning is a hands-on approach to education where students learn through direct experiences and activities, fostering a deeper understanding of the subject matter.

Features of the Series

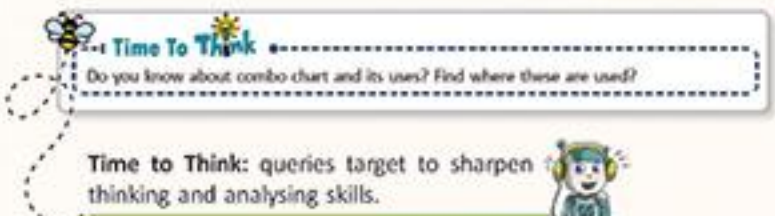
Warm Up: Activities based on previous knowledge, observation skills and thinking skills



Google-It: to encourage searching, thinking and discussion



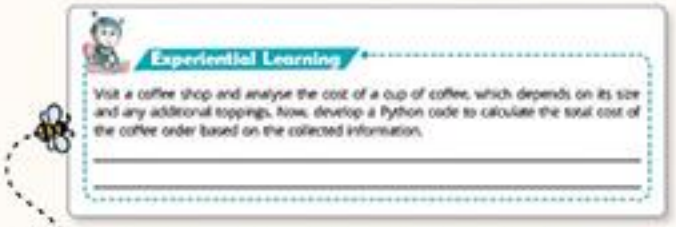
Blow Your Mind: provides interesting additional facts for extended learning



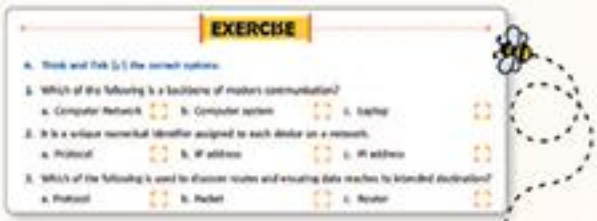
Time to Think: queries target to sharpen thinking and analysing skills.

In Summary: lists essential points for brush up

Learn About: gives the lesson a head start


Experiential Learning
Visit a coffee shop and analyse the cost of a cup of coffee, which depends on its size and any additional toppings. Now, develop a Python code to calculate the total cost of the coffee order based on the collected information.

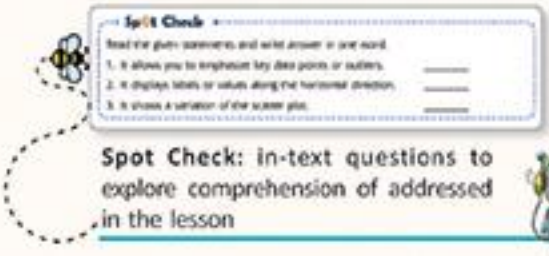
Experiential Learning: questions to promote interactive, collaborative and exploratory activities



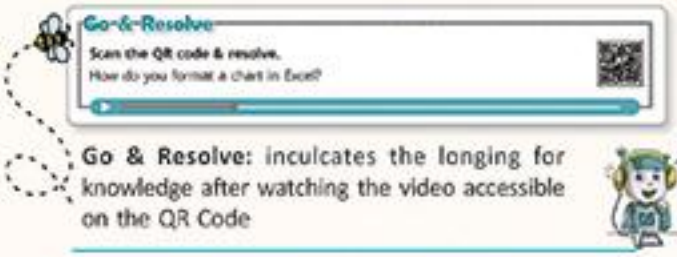
Exercises: MCQs, gap-filling, alternate responses, matching and wh- questions

Keyboard Shortcut: specify time-saving commands

Competency Based Question: questions to encourage analytical thinking


Spot Check
Read the given statements and write answer in one word.
1. It allows you to emphasize key data points or outliers. _____
2. It displays labels or values along the horizontal direction. _____
3. It shows a variation of the scatter plot. _____

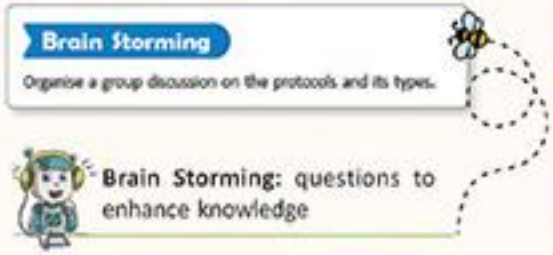
Spot Check: in-text questions to explore comprehension of addressed in the lesson



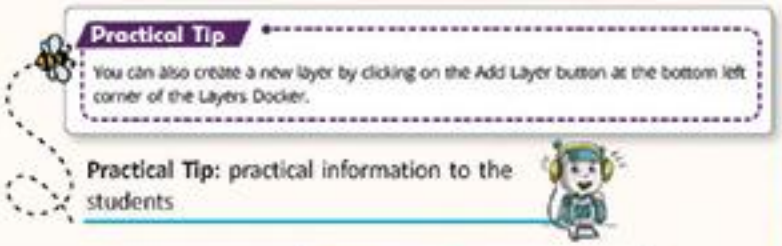
Go & Resolve: inculcates the longing for knowledge after watching the video accessible on the QR Code

Brain Test
Find eight words related to Krita in the grid.
F R A M E R K L E S S L
S M A L A C R Z H A X O
K C Y F R A M E A V K O
I R W Q A S R G B I J P
D U P L I C A T E N O I
E X P O R T R E S I N N
I N T E R N E O O T H G
T I M E L I N E N N Z N

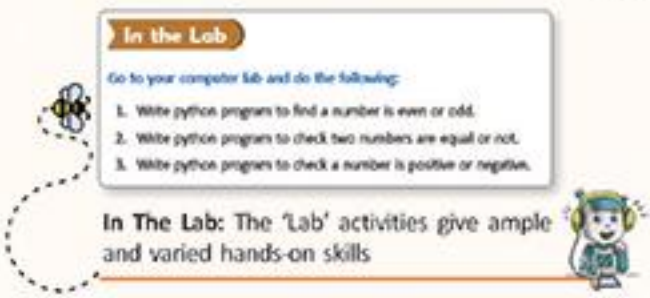
Brain Test: additional information to strengthen the understanding of concepts



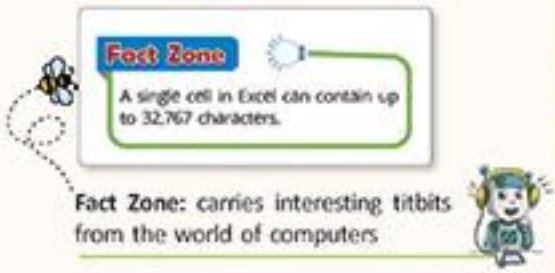
Brain Storming: questions to enhance knowledge


Practical Tip
You can also create a new layer by clicking on the Add Layer button at the bottom left corner of the Layers Docker.

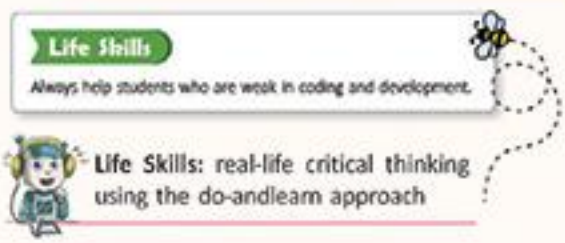
Practical Tip: practical information to the students


In the Lab
Go to your computer lab and do the following:
1. Write python program to find a number is even or odd.
2. Write python program to check two numbers are equal or not.
3. Write python program to check a number is positive or negative.

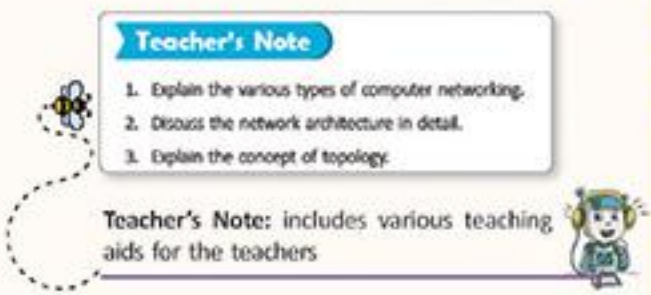
In The Lab: The 'Lab' activities give ample and varied hands-on skills



Fact Zone: carries interesting titbits from the world of computers



Life Skills: real-life critical thinking using the do-andlearn approach


Teacher's Note
1. Explain the various types of computer networking.
2. Discuss the network architecture in detail.
3. Explain the concept of topology.

Teacher's Note: includes various teaching aids for the teachers

Projects: research-based tasks

Heritage Point: explores India's rich heritage and encourages learners to preserve it

Work Log

Date (DD)	Name of Assignment	Nature of Assignment (T/P/E/W)*	Score/Grade (optional as per assignment)	Teacher's Remarks/ Signature	Parent's Remarks/ Signature

*T stand for Theory, P stands for Practical, E stand for Exercise and W stands for Worksheet

Preface

Think Digitally, our all new series based on Windows 10 and MS Office 2016 to make the learning experience interactive and hands-on for the young learners. The goal is to acquaint children with computers in a way that they do not see it as an external object anymore. It is an attempt to provide a learning environment that would encourage the growth of intrinsic and instinctive skills in the subject; making sure all through the journey that the child's interaction with computers comes naturally, and isn't forced.

The goal is to equip our children with relevant facts and data on the subject so that they become capable of using computer as a useful tool, without becoming too dependent on it.

The Salient Key features of the series are:

Learning Outcomes: list the focus of each lesson

Warm Up: activities based on previous knowledge, observation skills and thinking skills

Learn About: gives the lesson a head start

Exercises: MCQs, gap-filling, alternate responses, matching and wh- questions

Experiential Learning: questions to promote interactive, collaborative and exploratory activities

Competency Based Question: questions to encourage analytical thinking

Brain Test: additional information to strengthen the understanding of concepts

In The Lab: The 'Lab' activities give ample and varied hands-on skills

Teacher's Note: includes various teaching aids for the teachers

Activities: exploratory tasks

Projects: research-based tasks

Life Skills, Values: real-life critical thinking using the do-and-learn approach

Heritage Point: explores India's rich heritage and encourages learners to preserve it

Webquest: lists the important websites that students can refer to extra information.

Worksheets: to assess and evaluate the student understands of the concepts

Test Papers: include sets of questions to reinforce learning

SOF National Cyber Olympiad: provides sample questions to prepare for Cyber Olympiad

Think Digitally thus believes that a longing for knowledge is an indispensable ingredient in the recipe of learning.

Happy learning!

—

Author

Learning Outcomes

CHAPTER 1

After completing the chapter, Students will able to:

- Understand the fundamental concepts and principles of computer networking.
- Design and implement network topologies.
- Understand the wireless networking standards, security, and configuration.
- Understand different network architectures, such as client-server, and peer-to-peer.

CHAPTER 2

After completing the chapter, Students will able to:

- Understand the various types of chart.
- Create basic charts from data by selecting the data range.
- Understand how to customise charts as per user need.
- Change the appearance of charts.

CHAPTER 3

After completing the chapter, Students will able to:

- Navigate Krita's interface, including tools, menus, and workspace customization options.
- Create, organise, and managing layers within a Krita project.
- Apply layer styles and effects to enhance the visual appeal of artwork, such as gradients, and patterns.

CHAPTER 4

After completing the chapter, Students will able to:

- Understanding the principles of animation, such as keyframes, frames, and a timeline.
- Create animations using Krita's animation features.
- Export animations in various formats, including GIF, MP4, or sequences of images.
- Create storyboards to plan animations effectively.

CHAPTER 5

After completing the chapter, Students will able to:

- Understand the fundamentals of cloud computing its applications.
- Explore the concept of edge computing and its benefits.
- Explore the growth of IoT devices and their applications in industries such as smart cities, healthcare, and agriculture.

CHAPTER 6

After completing the chapter, Students will able to:

- Understand the concept of frames and the reasons for using frames to divide a web page into multiple sections.
- Use HTML frame elements to define frame layout and content.
- Understand the various form elements.
- Create a form by wrapping form elements within the <form> tag.

CHAPTER 7

After completing the chapter, Students will able to:

- Understand the basic syntax of if statements, including the if keyword, a condition, and a colon.
- Use indentation to create a block of code that runs when the condition is True.
- Use the else keyword to specify a block of code that runs when the condition in an if statement is False.

CHAPTER 8

After completing the chapter, Students will able to:

- Understand the syntax of for loop and its uses, including range ().
- Understand the while loop's syntax, including the while keyword, condition, and indented block.
- Use loop control statements like break and continue.
- Understand the syntax, structure of functions, or return statement.

CHAPTER 9

After completing the chapter, Students will able to:

- Explore how AI is revolutionizing the healthcare industry.
- Understand the role of AI in self-driving cars, drones, and other autonomous systems
- Understand the concepts and principles of AI ethics.
- Explore the importance of making AI systems transparent and understandable.

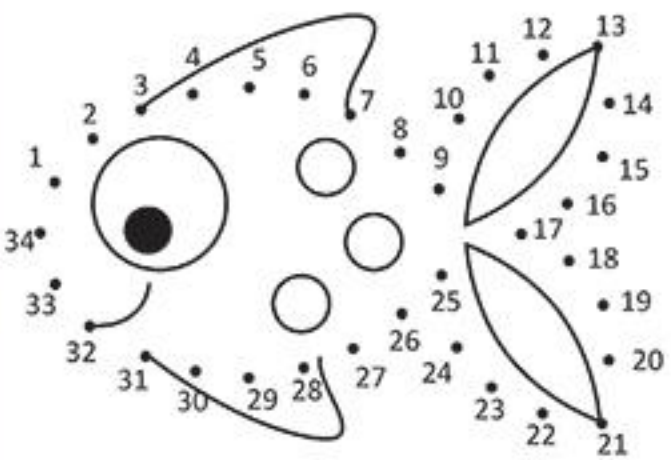
1 Computer Networking

Information Literacy, Collaboration, Critical Thinking

Warm Up

Have you heard about the term networking? If yes, then tell your teacher.

If not, then follow some instructions. Connect these numbers in a sequence to draw the given figure.



Name _____

How many lines _____

How many dots _____

Uses:_____

Learn About

- Computer Network
- Advantages of Computer Network
- Parts of a Computer Network
- Terms related to Computer Network
- Basic requirements for a Computer Network
- Types of Computer Network
- Topology
- Network Architecture
- Wireless Networking
- Protocols

COMPUTER NETWORK

Computer network is a backbone of modern communication. A computer network is a collection of interconnected devices or nodes. It enables the users to exchange information or services with seamless connectivity among devices, computers, and systems. These networks play a crucial role in facilitating efficient data transmission, collaboration, and access to a vast array of digital resources.

ADVANTAGES OF COMPUTER NETWORK

As you know that computer network facilitates the sharing of resources among connected devices. Now, learn the various advantages of computer network:

- It allows seamless communication via email, video conferencing, messaging, and other applications. It also enhances collaboration and information sharing within organizations and globally.
- It allows to share the resources, leading to cost savings.
- It allows the users to connect to the network from anywhere, providing the freedom to work or accessing information while on the move.
- It allows for centralized data management, making it easier to implement security measures to protect sensitive information.

PARTS OF A COMPUTER NETWORK

Let's learn the various parts of a computer network.

Computer

It is a primary device that is used to share and access information.

Server

It is a type of computer that stores and manage shared resources and provides services to other devices.

Fact Zone

Bluetooth technology is used to connect computers, printer, etc. in a small room or a small office. Bluetooth uses radio waves to connect mobile devices. Bluetooth supports short distance transmission—usually 30 feet or less.

Router

It is a devices that direct data traffic between different parts of a network.

Switch

It is a device that manages data traffic within a network by directing data to its intended destination.

Access Point

It is a device that allows wireless devices to connect to the network.

Firewall

It is a security device that controls and filters network traffic to protect against unauthorized access.

Modem

It is a device that allows connection to the internet, enabling access to global networks.

TERMS RELATED TO COMPUTER NETWORK

LAN (Local Area Network): A network confined to a limited geographic area, typically within a building or campus.

WAN (Wide Area Network): A network that covers a broad geographic area, often connecting multiple LANs.

IP Address (Internet Protocol Address): A unique numerical identifier assigned to each device on a network, allowing communication between devices.

Protocol: A set of rules that govern data communication on a network, ensuring seamless and standardized communication.

Bandwidth: The maximum data transfer rate of a network or internet connection, typically measured in bits per second (bps).

Router: A device that discover routes and ensures data reaches its intended destination.

DNS (Domain Name System): A system that translates human-readable domain names into IP addresses for computer use.

Packet: A unit of data sent across a network, containing both the actual data and control information.

Topology: The physical or logical arrangement of devices in a network, defining how they're connected.

Fact Zone

Internet is controlled by 75 million servers.

BASIC REQUIREMENTS FOR A COMPUTER NETWORK

These are some basic requirements that are essential to setting up a reliable computer network to establish efficient communication and resource sharing amongst connected devices.

Devices: These two devices are mandatory for a computer network:

- Computers and Servers: Core devices that utilize the network to share and access data.
- Switches and Routers: Devices that manage and direct data traffic within the network.

Network Interface Cards (NICs): These are the hardware components enabling devices to connect to the network, either wired or wirelessly.

Cables and Connectors: These are the physical components linking devices within the network, such as Ethernet cables and USB connectors.

Network Communication Protocols: These are the standardized rules governing data transmission and communication across the network.

Network Services: These are the essential services like file sharing, printing, email, and web browsing provided to network users.

Networking Software: Operating systems and applications enabling devices to connect and communicate effectively within the network.

Network Security Measures: Firewalls, encryption, access controls, and other security mechanisms to protect data in a network.

Administration and Management Tools: Software and tools for monitoring, managing, and troubleshooting network performance and issues.

Networking Standards and Protocols: These are the established rules and protocols, such as TCP/IP, defining how devices communicate and operate in a network.

Power Supply and Backup: Reliable power sources and backup systems to ensure uninterrupted network operations even during power outages.

Network Design and Topology: A well-planned network design and topology to efficiently connect devices and manage traffic flow.

Internet Connectivity: Connection to the internet, often facilitated through internet service providers (ISPs), for external communication and access to online resources.

Spot Check

Name the following:

1. These are the standardized rules governing data transmission and communication across the network. _____
2. It is a device that allows wireless devices to connect to the network. _____
3. It allows to share the resources, lead to cost savings. _____

TYPES OF COMPUTER NETWORK

There are several types of computer networks, each network is designed to serve specific purposes based on their size, coverage, and functionalities. Let's understand these computer networks.

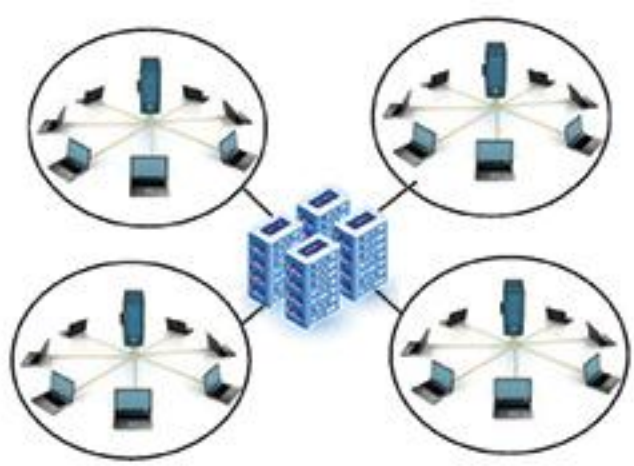
LOCAL AREA NETWORK (LAN)

A Local Area Network (LAN) is a network limited to a specific geographic area, like a home or office. It typically employs Ethernet technology to connect computers, printers, servers, and other devices. LANs offer high data transfer rates and are commonly used for sharing resources, such as files and printers, within a limited area.

Local Area Network (LAN)

WIDE AREA NETWORK (WAN)

A Wide Area Network (WAN) spans a large geographic area, often across cities, or countries. WANs connect multiple LANs and employ technologies like leased lines, satellites, and microwave links. While WANs have lower data transfer rates compared to LANs, they facilitate communication over vast distances, enabling organizations with dispersed locations to stay connected.



Wide Area Network (WAN)

METROPOLITAN AREA NETWORK (MAN)

A Metropolitan Area Network (MAN) covers a city or a town, providing high-speed connectivity within that specific geographic region. MANs are often used by universities, businesses, or government entities to interconnect multiple LANs and enable efficient data transmission within a metropolitan area.

Metropolitan Area Network (MAN)

PERSONAL AREA NETWORK (PAN)

A Personal Area Network (PAN) is a small network within an individual's workspace or immediate environment, connecting personal devices like smartphones, laptops, tablets, and wearable technology. Technologies like Bluetooth and Infrared are commonly used to create PANs, enabling seamless communication and data sharing among personal devices.

Personal Area Network (PAN)

CAMPUS AREA NETWORK (CAN)

CAN is also known as Cluster Area Network connects two or more LANs that are limited to specific geographical areas, for example, college campus, office building etc. A campus area network is larger than LAN since it may span in multiple buildings within a limited area.

Campus Area Network (CAN)

TOPOLOGY

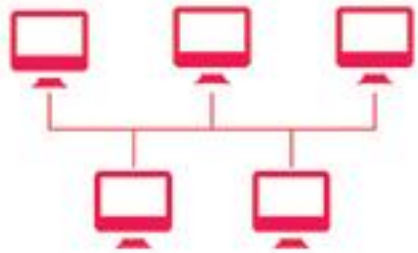
Network topology is the layout or arrangement of different interconnected elements in a computer network. It defines how devices and nodes in a network are structured and how they communicate. The choice of network topology is an important aspect of network design as it impacts the overall efficiency, reliability, and ease of management of the network.

COMMON TYPES OF NETWORK TOPOLOGY

Network topology plays a crucial role in determining the overall performance and effectiveness of a computer network. Now learn the different types of network topologies.

Bus Topology

A bus topology involves a single central cable to which all devices are connected. Data is transmitted along the cable, and each device receives the data, but only the intended recipient processes it. This topology is simple but can face issues if the main cable is damaged.

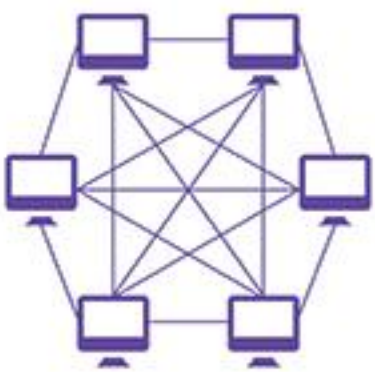


Star Topology

In a star topology, all devices are connected to a central hub or switch. The central hub acts as a mediator, managing and controlling communication between devices. This topology is easy to set up and troubleshoot but is dependent on the central hub.

Ring Topology

In a ring topology, devices are connected in a circular manner, where each device is connected to two others, forming a ring. Data flows in one direction, and each device passes the data along until it reaches the intended recipient. This topology is reliable and has uniform data flow but can be disrupted if one device fails.



Mesh Topology

Mesh topology is characterised by every device connecting to every other device in the network. It provides multiple paths for data transmission, ensuring high reliability and fault tolerance. However, it requires a significant number of connections and can be complex to manage

Hybrid Topology

Hybrid topology is a combination of two or more basic topologies. For example, a network might be a combination of star and bus topology. This provides the benefits of multiple topologies and can be customized to suit specific requirements.

Art Integration

In the space provided draw a topology of your choice and write its uses in notebook.

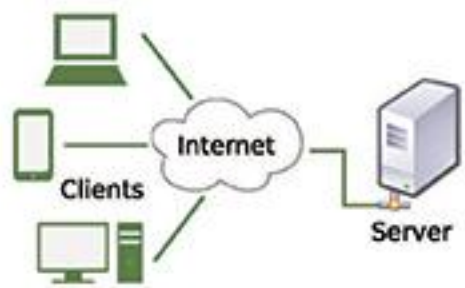
Fact Zone

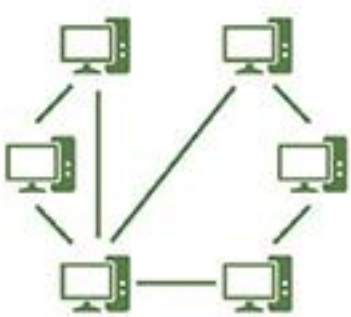
To access any network we Log on to that network. What does Logging on mean? Logging on involves typing in our Username or code followed by the password. Once typed in, the network software checks the details typed in by us against a list of authorised users. If the typed data matches then, and only then, we are allowed to proceed.

NETWORK ARCHITECTURE

CLIENT-SERVER ARCHITECTURE

In this network, clients (devices like computers) request services or resources from centralized servers. Servers respond to these requests and provide the necessary data or services. It's efficient and allows centralized management.





PEER-TO-PEER ARCHITECTURE

In this network, each device (peer) can act as both a client and a server, sharing resources directly without relying on a centralized server. This architecture is more decentralized.

HYBRID ARCHITECTURE

Hybrid architecture combines elements of both client-server and peer-to-peer models. It offers the benefits of centralization and decentralization, providing a balance based on specific network requirements.

CLOUD COMPUTING ARCHITECTURE

Cloud computing architecture utilises a network of remote servers hosted on the internet to store, manage, and process data. It offers scalability, flexibility, and cost-efficiency, making it popular for modern applications and services.

Wireless Channels

Wireless channels are specific frequencies designated for wireless communication. Devices use these channels to transmit and receive data.

Practical Tip

Always choose a strong password for Wi-fi.

TYPES OF WIRELESS NETWORKING

Wi-Fi

Wi-Fi is the most common wireless networking technology. It operates on radio frequency bands. It is widely used for connecting devices within homes, offices, and public places.

Bluetooth

Bluetooth is a short-range wireless technology commonly used for connecting peripherals like keyboards, mouse, headsets, and mobile devices to computers.

Cellular Networks

Cellular networks are a form of wireless networking that connect mobile devices to a telecommunications network through cellular towers. They enable voice calls, text messaging, and internet access.

ADVANTAGES OF WIRELESS NETWORKING

Mobility and Flexibility: Users can connect to the network from anywhere within the coverage area, providing freedom of movement.

Easy Installation and Scalability: Wireless networks can be set up quickly, and it's easy to expand or modify them as needed.

Reduced Cable Clutter: Wireless networks eliminate the need for physical cables, reducing clutter and allowing for a cleaner workspace.

Cost-Efficiency: In many cases, wireless networking can be more cost-effective than installing and maintaining wired infrastructure.

Access Control: Utilizing strong passwords and access controls it ensures only authorized users can connect to the network.

Regular Updates and Patches: Keeping devices and software up to date with the latest security measures is crucial for network security.

Fact Zone

The first wireless network was invented in 1971.

PROTOCOLS

Protocols are the foundation of modern communication.
These are the set of predefined rules and conventions that govern how data is transmitted, received, and interpreted across a network.

They ensure that devices and systems can communicate effectively and accurately with each other. Understanding and implementing protocols are essential for a well-functioning and secure digital infrastructure.

CHARACTERISTICS OF PROTOCOLS

- Error Detection and Correction
- Flow Control
- Reliability
- Security

TYPES OF PROTOCOLS

You know about the protocols and their characteristics. Now learn about the various types of protocols.

Google-It

How many emails are sent per day?

Communication Protocols

These protocols define the rules for data transmission between devices. Examples include TCP (Transmission Control Protocol) and UDP (User Datagram Protocol).

Internet Protocols

Internet protocols are a subset of communication protocols that facilitate communication over the internet. The most well-known is the TCP/IP (Transmission Control Protocol/Internet Protocol), which is foundational for internet communication.

Application Layer Protocols

These protocols define communication standards specific to applications. For instance, HTTP (Hypertext Transfer Protocol) is used for web browsing, SMTP (Simple Mail Transfer Protocol) for email, and FTP (File Transfer Protocol) for file sharing.

Transport Layer Protocols

Transport layer protocols govern end-to-end communication between devices. Besides TCP and UDP, this includes SCTP (Stream Control Transmission Protocol).

Network Layer Protocols

Network layer protocols focus on routing and forwarding data packets across networks. IP (Internet Protocol) is a fundamental network layer protocol.

Blow Your Mind

The internet's infrastructure is comprised of a vast network of over 550,000 miles of underwater cables.

Link Layer Protocols

Link layer protocols define rules for communication within a local network, such as Ethernet and Wi-Fi.

In Summary

- A computer network is a collection of interconnected devices or nodes.
- A Local Area Network (LAN) is a network limited to a specific geographic area.
- A Wide Area Network (WAN) spans a large geographic area, often across cities, or countries.
- A Metropolitan Area Network (MAN) covers a city or a town, providing high-speed connectivity within that specific geographic region.
- A Personal Area Network (PAN) is a small network within an individual's workspace or immediate environment.
- Cluster Area Network connects two or more LANs that are limited to specific geographical areas.
- Network topology is the layout or arrangement of different interconnected elements in a computer network.
- Wireless networking is a technology that allows devices to connect and communicate without the need for physical cables or wired connections.
- Protocols are the foundation of modern communication.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which of the following is a backbone of modern communication?

   a. Computer Network ☐ b. Computer system ☐ c. Laptop ☐

2. It is a unique numerical identifier assigned to each device on a network.

   a. Protocol ☐ b. IP address ☐ c. PI address ☐

3. Which of the following is used to discover routes and ensuring data reaches its intended destination?

   a. Protocol ☐ b. Packet ☐ c. Router ☐

4. Hybrid architecture is a combination of _____ .

   a. client-server ☐ b. Peer-to-peer ☐ c. Both a & b ☐

5. Which of the following is used to transmit and receive radio signals between the wireless communication devices?

   a. Antennas ☐ b. Router ☐ c. NIC ☐

6. DNS stands for the _____ .

   a. Domain Name System ☐ b. Domain Number System ☐ c. Data Number system ☐

B. Write 'T' for true and 'F' for false.

1. Link layer protocols focus on routing and forwarding data packets across networks. _____
2. Internet protocols facilitate communication over the internet. _____
3. Cellular networks are not a form of wireless networking. _____
4. Bluetooth is a short-range wireless technology commonly used for connecting peripherals. _____
5. A well-designed architecture incorporates security measures to protect data and resources. _____
6. Hybrid topology is a combination of two or more basic topologies. _____
7. A Local Area Network is a network limited to a specific geographic area. _____

C. Answer the following questions.

1. Write any two advantages of computer network.

   _____

   _____

2. What is Bandwidth?

   _____

   _____

3. Write any three parts of computer network.

   _____

   _____

4. What is peer-to-peer architecture?

   _____

   _____

5. Differentiate between LAN and WAN.

   _____

   _____

6. Define topology. Also explain ring topology.

   _____

   _____

   _____

7. What is computer network? Write basic requirements for a computer network.

8. What are the protocols? Explain Application layer protocols.

Brain Test

Critical Thinking, Computational Thinking

In the word search, find 8 words related to the chapter.

N	E	T	W	O	R	K	O	M	W	I	R	E	L	E	S	S	C
S	M	A	R	T	H	I	G	H	W	A	Y	X	Z	H	A	X	O
N	A	N	C	E	R	Z	X	T	Y	V	F	U	D	A	V	K	W
I	R	W	Q	A	S	R	M	Q	E	X	D	F	G	B	I	J	A
C	T	Q	W	E	E	T	R	E	W	Q	R	T	T	O	L	I	N
V	C	H	A	T	B	O	T	S	G	Y	T	A	N	T	A	Z	T
T	O	P	O	L	O	G	Y	X	Z	P	R	O	T	O	N	O	L
P	T	A	S	M	A	R	T	S	E	N	S	O	R	S	I	N	R
I	N	T	E	R	N	E	T	B	L	U	E	T	O	O	T	H	Z
R	E	P	L	E	A	A	P	O	E	X	R	N	I	N	N	Z	N

Brain Storming

Social Interaction, Communication

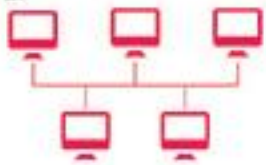
Organise a group discussion on the protocols and its types.

Activity

Creativity, Collaboration

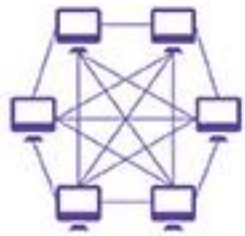
A. Take chart paper and draw any two devices that are used in computer networking.

B. Identify the networking topologies by looking at their arrangements.

1. 

2.

3.

4. 

Life Skills

Self development

Hackers are such people who illegally access the information in any network and steal information like credit card details, and security information like passwords.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Make a document on computer networking, also add some advantages.
2. Now add information about wireless networking.
3. Create a comparison and take a printout.
4. Now show to your teacher.

Teacher's Note

1. Explain the various types of computer networking.
2. Discuss the network architecture in detail.
3. Explain the concept of topology.

2

Charts in Excel

Information Literacy, Collaboration, Critical Thinking

Warm Up

Read the given statements and write the function name associated with the given statements.

1. It returns the current date. _____
2. It returns the current date and time. _____
3. It returns the largest value in a range of cells. _____
4. It returns the smallest value in a range of cells. _____
5. It returns text into uppercase. _____
6. It returns text into lowercase. _____
7. Write the basic rules to enter a formula:

_____

_____

_____

_____

Learn About

- Charts
- Types of Charts
- Changing a chart Type
- Benefits of a Charts
- Creating a Chart in Excel
- Moving and Resizing the Chart
- Components of a Chart
- Formatting a Chart

CHARTS

In Excel, charts are powerful tools that allow you to represent data in a structured manner. It also makes it easier to analyse and understand the data. Whether you're working with financial data, sales figures and more, Excel's charts are capable of helping you to present your data in a clear and concise manner.

BENEFITS OF A CHARTS

Charts provide various benefits when you are working with data:

Visualisation: Charts convert raw data into visual representations, making trends and patterns easier to understand.

Communication: Charts are an effective way to communicate your data to others.

Analysis: Charts help you analyse data quickly and make data-driven decisions.

Comparison: Charts help you to compare data sets or trends more easily.

Highlighting: Charts allow you to emphasize key data points or outliers.

COMPONENTS OF A CHART

A chart has many components, some of them are discussed here:

Chart Area: It is an area where we can create and modify the charts.

Plot Area: The plot area is the region within the chart that displays the actual data points, bars, lines, or other chart elements. It's where you can see the visual representation of your data.

X-Axis (Horizontal Axis): The horizontal axis typically represents the independent variable or categories. It displays labels or values along the horizontal direction.

Y-Axis (Vertical Axis): The vertical axis represents the dependent variable. It displays labels or values along the vertical direction. In some cases, charts may have a secondary Y-axis to represent a second set of data on the same chart.

Data Points: Data points are individual values or markers representing specific data on the chart. For example, in a line chart, each point on the line corresponds to a data point.

Data Labels: These labels, often associated with data points, provide additional information about the data.

Legend: The legend is a key that explains the colours or symbols used in the chart represent which data series. It helps readers understand what each element in the chart represents.

Chart Title: A title that provides an overall description or context for the chart. It helps users understand the purpose of the chart.

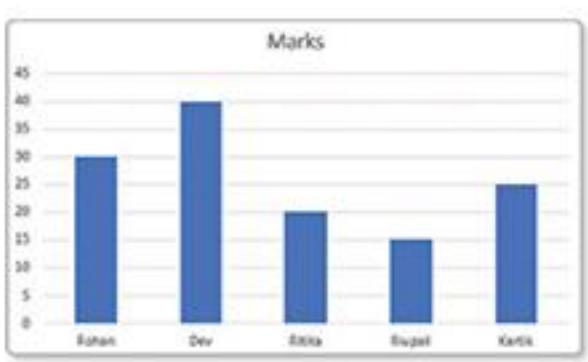
Gridlines: Gridlines are horizontal and vertical lines that help readers interpret values on the chart more accurately. You can add or remove gridlines as needed.

TYPES OF CHARTS

Excel has a variety of chart types, and each type is used for different purposes. Here are some common chart types.

COLUMN CHART

A column chart is like a graph that uses vertical bars to show information. The categories or types of things being talked about go along the bottom, and the numbers related to them go on the side.

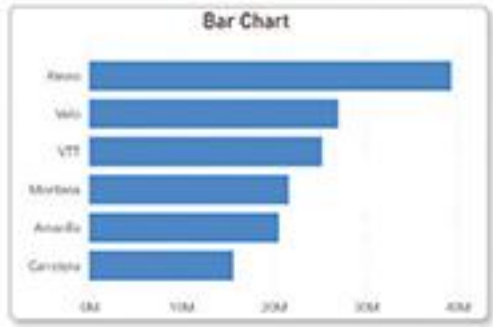


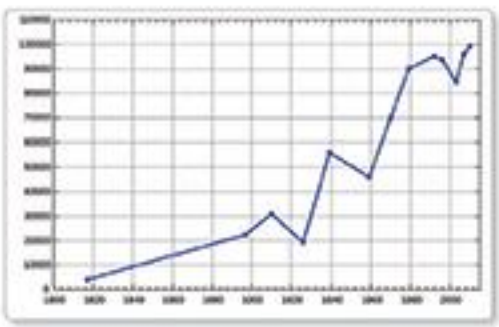
Time To Think

Do you know about combo chart and its uses? Find out where these are used?

BAR CHART

A bar chart is a bit like a column chart, but the bars are lying on their sides. It's really good for comparing things or figuring out which thing is the biggest or smallest. The names of the things go up and down, and the numbers go side to side.



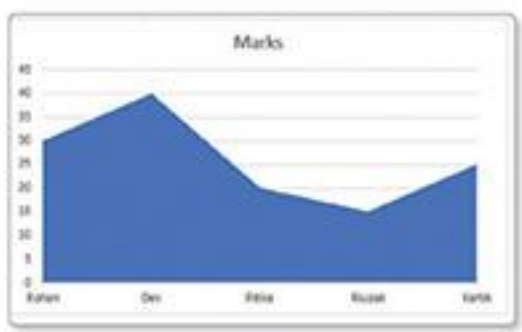


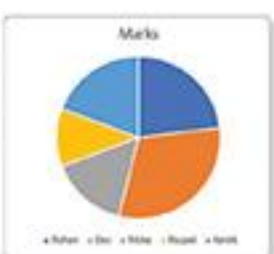
LINE CHART

A line chart is a special kind of chart that shows how something changes over time, like how a plant grows every week. It connects the dots to make a line, so you can easily see the pattern.

AREA CHART

The area chart shows how things change a lot or a little over time. It's like a picture puzzle where each piece represents a part, and when you put all the pieces together, you see the whole picture.



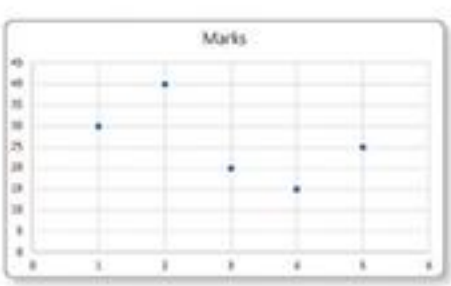


PIE CHART

It is suitable for displaying parts of a whole, such as the composition of a budget or market share. A pie chart is different from the rest of the chart types, as it shows just one data series.

DOUGHNUT CHART

It consists of more than one data series. Each ring represents one data series in this chart. It displays the relationship of parts to a whole.

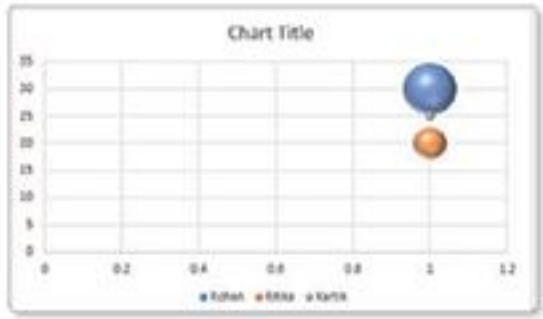


SCATTER PLOT

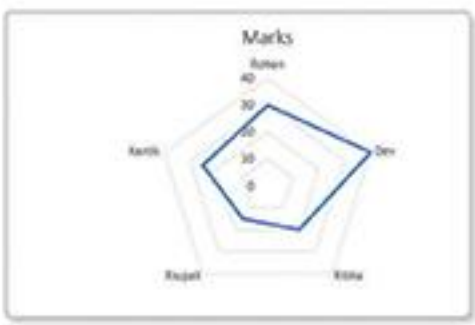
It shows the relationship between two sets of data points, useful for identifying correlations.

BUBBLE CHART

It shows a variation of the scatter plot, where the size of the bubbles represents a third data dimension.



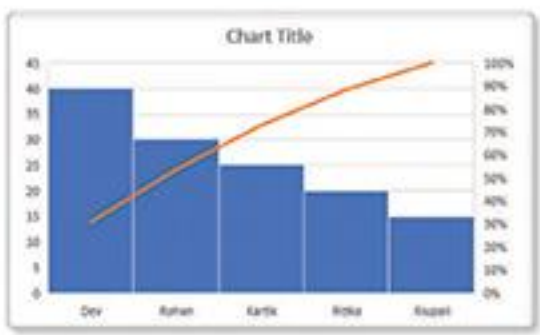
RADAR CHART



It displays data in a circular pattern, often used for comparing multiple variables.

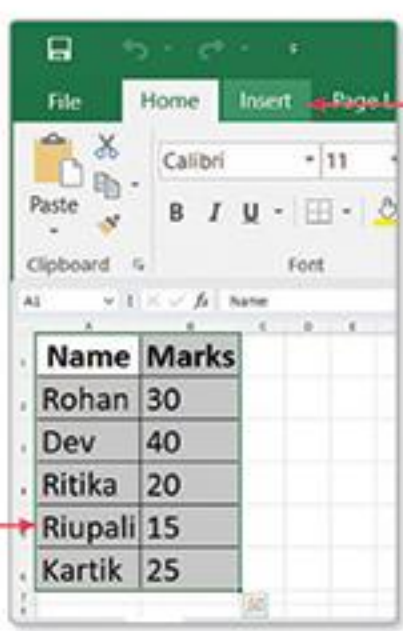
HISTOGRAM

It is type of chart and is used to display the distribution of data in a frequency distribution.



CREATING A CHART IN EXCEL

Now, you have learned about the different chart components and chart type. Let's learn how to create a chart. Follow the given steps:

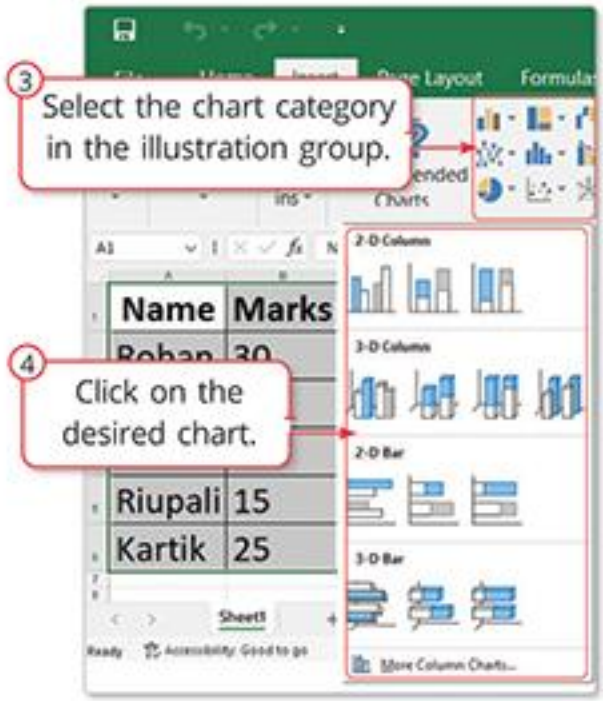


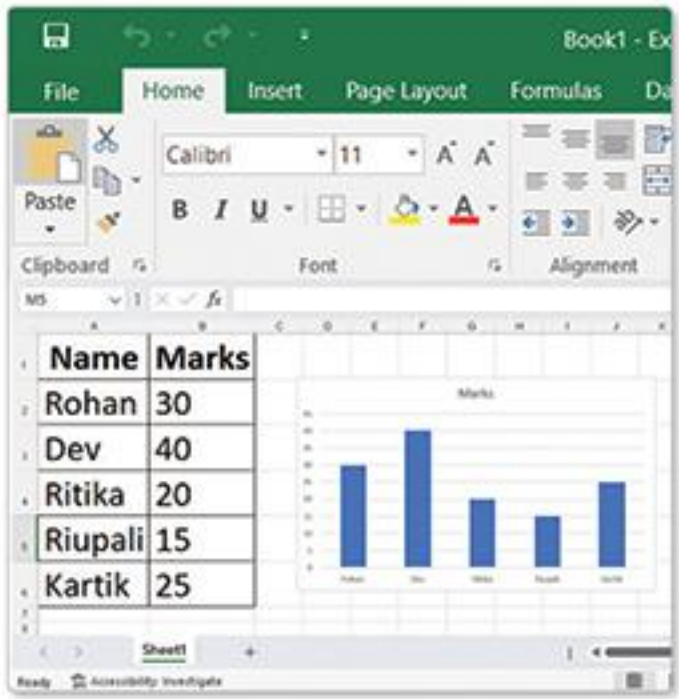
2 Click on the "Insert" tab.

1 Select the data.

Practical Tip

Select a range of cells on which you wish to create a chart and press the F11 key. Excel will create chart for you.





Spot Check

Read the given statements and write answers in one word.

1. It allows you to emphasize key data points or outliers. _____
2. It displays labels or values along the horizontal direction. _____
3. It shows a variation of the scatter plot. _____

Go & Resolve

Scan the QR code & resolve.

How do you format a chart in Excel?

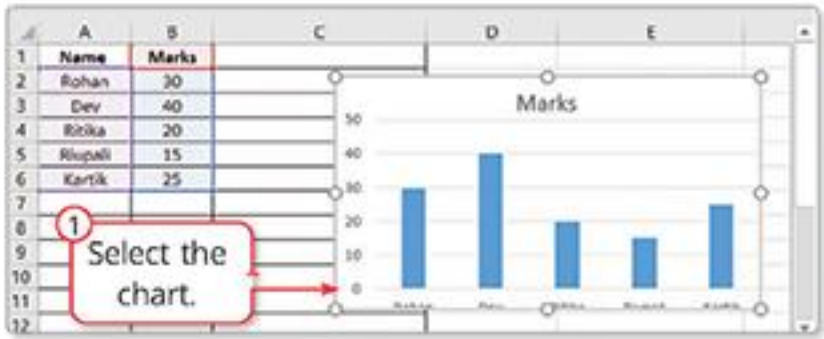
FORMATTING A CHART

Excel 2016 allows you to format a chart like change the chart colour or chart style.

To change the colour of a chart, follow the given steps:

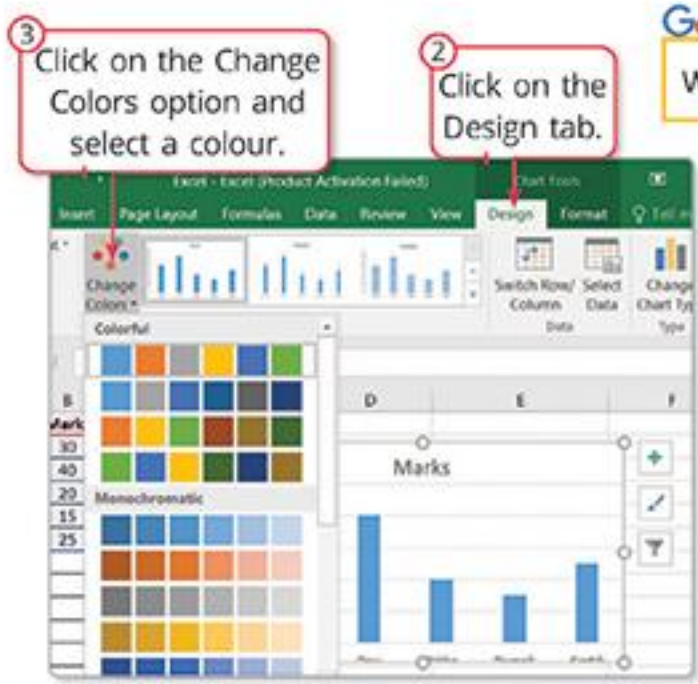
Blow Your Mind

In 1990, Excel 3.0 became the pioneer of desktop applications.



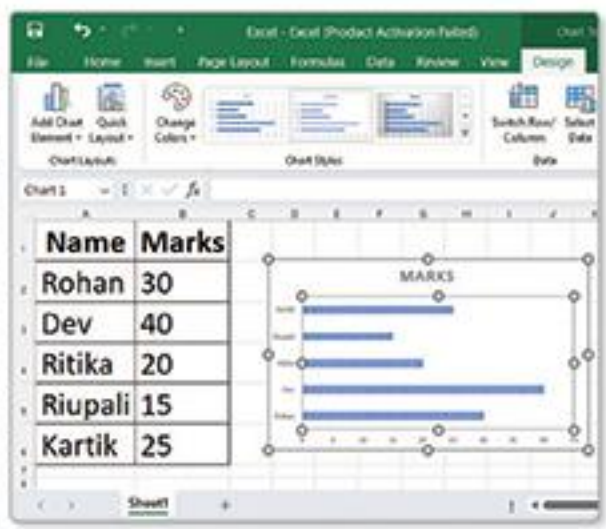
Practical Tip

To print a chart, select the chart and click on the File > Print. In the Print screen, select the print selected chart option under the settings section. Click on Print.



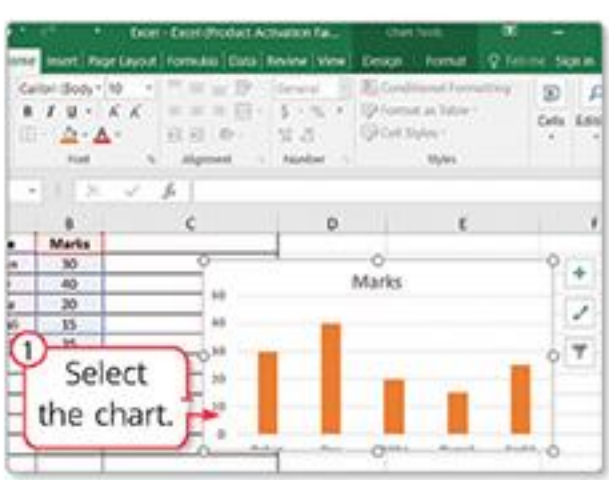
Google-It

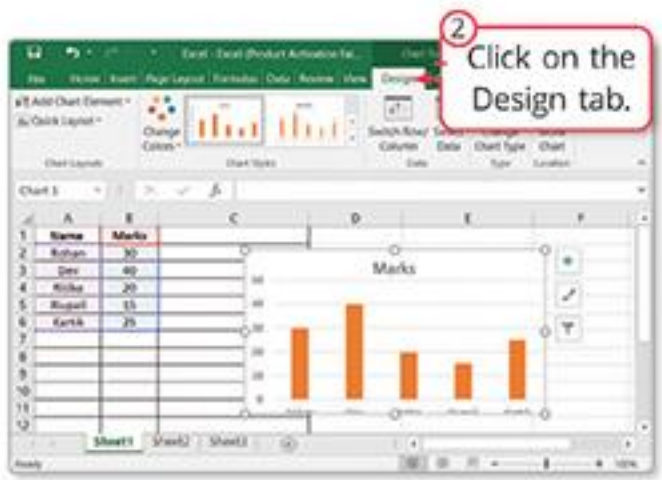
What is the latest version of MS Excel?

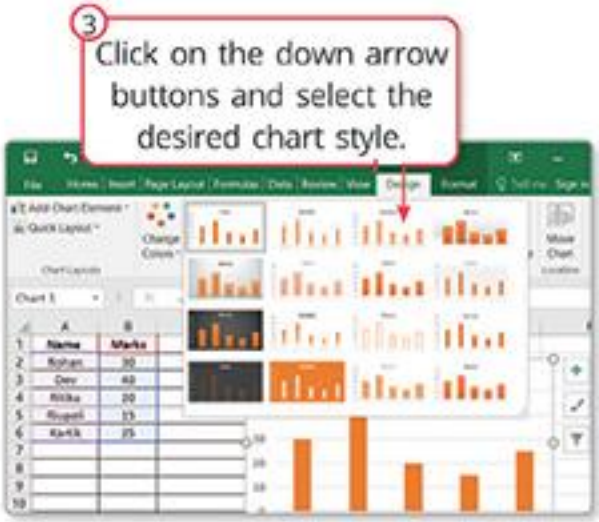


CHANGING A CHART TYPE

To change the chart style, follow the given steps:







Practical Tip

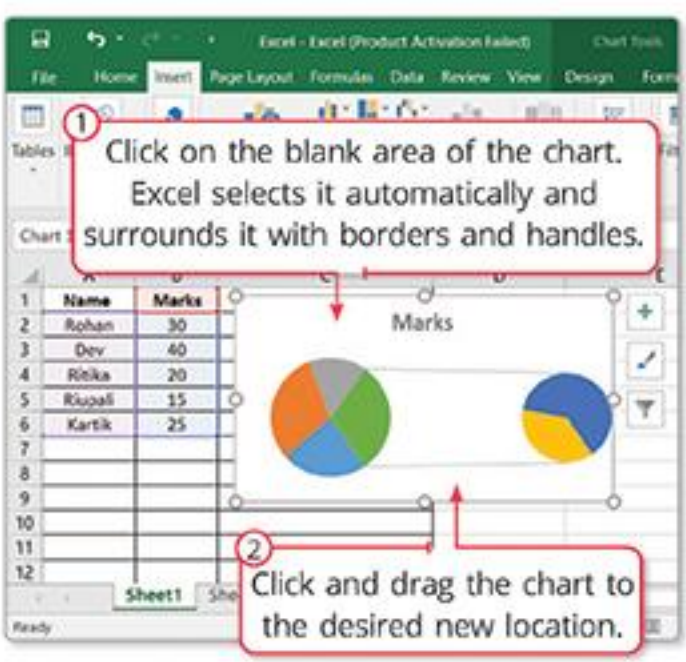
You can also open format options for chart by double-clicking on the chart.

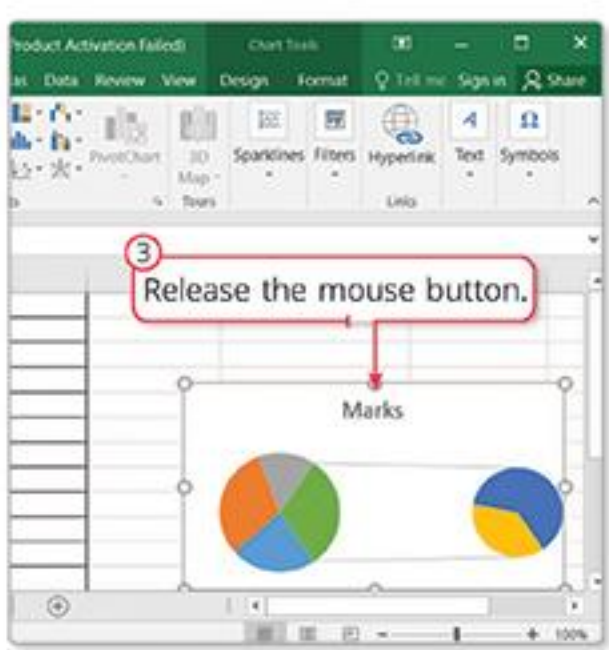
Fact Zone

A single cell in Excel can contain up to 32,767 characters.

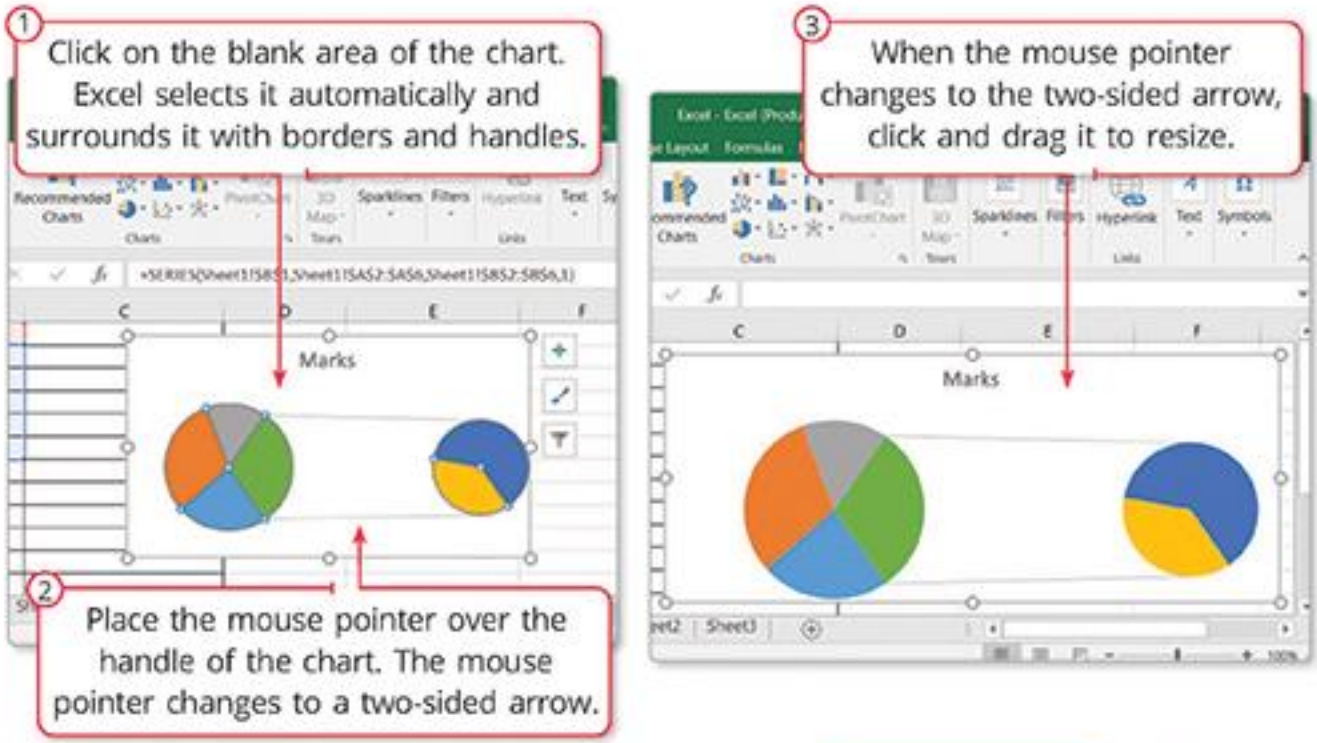
MOVING AND RESIZING THE CHART

To move the chart, follow the given steps:


1
Click on the blank area of the chart. Excel selects it automatically and surrounds it with borders and handles.
Marks
2
Click and drag the chart to the desired new location.



To resize the chart, follow the given steps:


1
Click on the blank area of the chart. Excel selects it automatically and surrounds it with borders and handles.
2
Place the mouse pointer over the handle of the chart. The mouse pointer changes to a two-sided arrow.
3
When the mouse pointer changes to the two-sided arrow, click and drag it to resize.
Marks
Marks

Google-It

What are the 3 common uses of Excel?

Fact Zone

There are 500+ keyboard shortcuts in MS Excel.

In Summary

- In Excel, charts are powerful tools that allow you to represent data in a structured manner.
- The plot area is the region within the chart that displays the actual data points, bars, lines, or other chart elements.
- Y-Axis displays labels or values along the vertical direction.
- A column chart is like a graph that uses vertical bars to show information.
- A bar chart is a bit like a column chart, but the bars are lying on their sides.
- A line chart is a special kind of chart that shows how something changes over time.
- The area chart shows how things change a lot or a little over time.
- Doughnut chart consists of more than one data series.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which of the following charts consist of more than one data series?

   a. Doughnut chart ☐ b. Area chart ☐ c. Bar chart ☐

2. Under which tab, you can create a chart?

   a. Home ☐ b. Insert ☐ c. Formula ☐

3. Which of the following chart displays data in a circular pattern, often used for comparing multiple variables?

   a. Doughnut chart ☐ b. Radar chart ☐ c. Bar chart ☐

4. Which of the following provides an overall description for the chart?

   a. Axis ☐ b. Legend ☐ c. Chart Title ☐

5. Which of the following displays labels or values along the vertical direction?

   a. X-Axis ☐ b. Y-Axis ☐ c. Z-Axis ☐

B. Fill in the blanks.

Hints Charts, Scatter, plot area, legend, structured, Gridlines

1. Charts are powerful tools that allow you to represent data in a _____ manner.
2. _____ helps you to compare data sets or trends more easily.
3. The _____ is the region within the chart that displays the actual data points or bars.
4. The _____ is a key that explains the colours used in the chart.
5. _____ help readers interpret values on the chart more accurately.
6. _____ chart shows the relationship between two sets of data points.

C. Answer the following questions.

1. What do you mean by data labels?

   _____

   _____

2. Write a difference between X-Axis and Y-Axis.

3. Write any two benefits of a chart.

4. What is the use of Scatter chart?

5. What is line chart?

6. Define Chart and write steps to create a chart.

7. How do format a chart?

8. Write steps to Change a chart type.

COMPETENCY BASED QUESTION...

Critical Thinking, Digital Literacy

Shubham was studying the growth of a company's profits over a period. He entered the data that was available in Excel and now wants to understand it more easily by displaying it in a way that shows the magnitude of change over time. Which type of chart should he use for this?

Brain Test

Critical Thinking, Computational Thinking

In the word search, find 6 words related to the chapter.

C	H	A	R	T	Z	X	C	V	E	Q	W
Q	K	P	O	I	L	E	G	E	N	D	Z
W	Z	E	R	T	Y	U	I	P	S	A	Q
X	D	A	T	A	R	T	L	I	O	N	Z
U	Z	C	V	F	O	R	M	E	T	Q	A
R	T	Y	U	H	B	V	C	X	X	Z	X
Q	S	C	A	T	T	E	R	W	C	X	I
D	O	U	G	H	N	U	T	A	Z	T	S

Life Skills

Digital Literacy

Choosing the right chart type depends on your data and the story you want to tell. Remember to save your Excel file to keep the chart and data together.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Enter the data of five people and their salaries.
2. Create a line chart using above data.
3. Change the type of chart you want.
4. Change the background of the chart.
5. Save this Excel fie with the appropriate name.

Teacher's Note

1. Explain the charts and their benefits.
2. Demonstrate to the students how to create a chart.
3. Explain how to format a chart using different tools.

3 Layers in Krita

Information Literacy, Collaboration, Critical Thinking

Warm Up

Identify the given tools of Krita and write their uses:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Learn About

- Revision of Krita
- Selecting an image
- Layers in Krita
- Components of Krita
- Drawing shapes
- Working with Layers
- Open an image
- Drawing freehand

REVISION OF KRITA

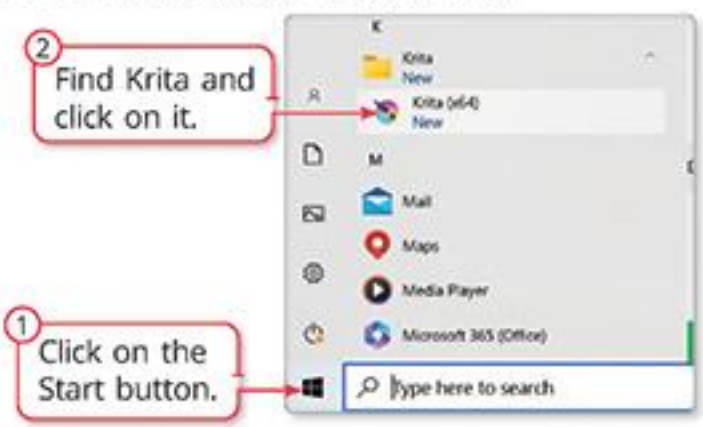
Krita is a free and open source program available on internet. It is mainly used for drawing, image editing and animation. It was made by artists who support universal access to art.

Krita has various useful features, some of them are discussed here.

- **Easy to Use:** Krita has very simple interface. It consists of menus, buttons, panels that are easy to understand.
- **Free and Open Source:** Krita is available free of cost on the internet. Users can download the Krita and can use it easily.
- **Built-in Gallery:** Krita has a built-in gallery of vectors that you can use in your drawing.
- **Customized Layout:** Krita allows you to change the layout of screen as per your need.

OPENING KRITA

To open Krita, follow the given steps:



Practical Tip

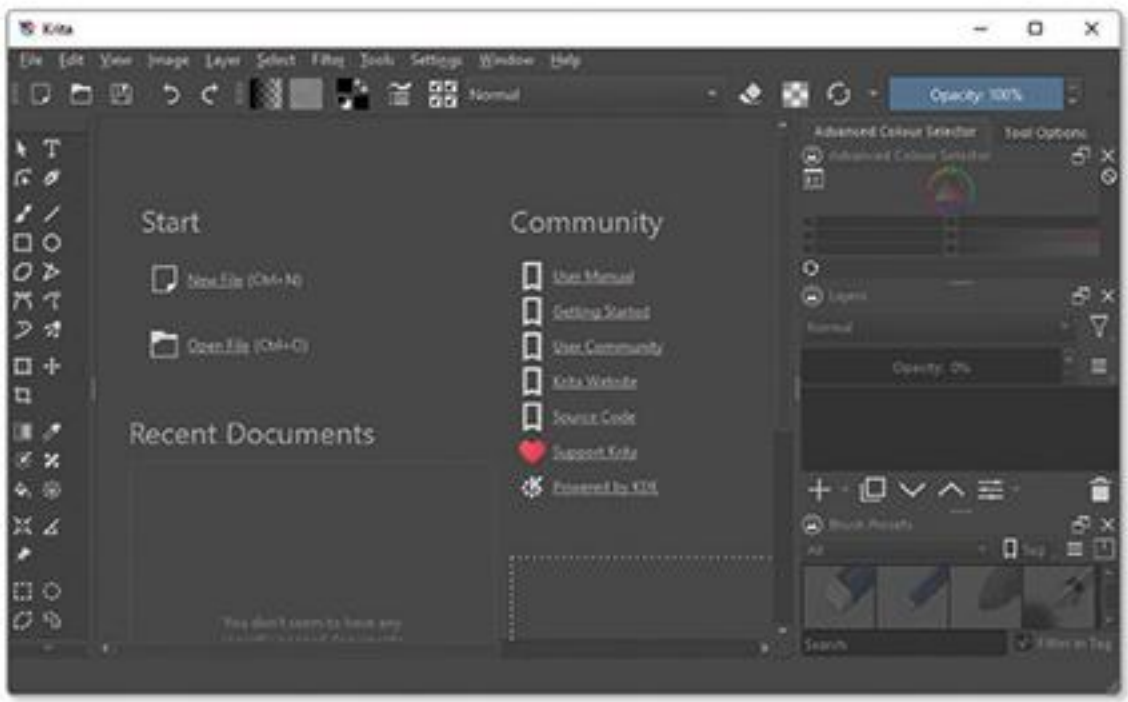
To open Krita, Type krita in the Search box and press Enter key.

COMPONENTS OF KRITA

Let's learn about the components of Krita window.

- **Title bar:** It displays the name of the program and name of the file.
- **Menu bar:** It is located below the Title bar and displays the all menus like File, Edit, View, Layers, etc.
- **Options bar:** It is located below the Menu bar. It shows the currently selected tools that you are using for editing.
- **Toolbox:** It is located on the left side of the Krita window. It consists of various image editing tools.

- **Workspace:** It is a blank area where you can open and edit your drawing.
- **Layers Docker:** It is used to set order of visibility of the objects.
- **Status Bar:** It displays the size of the Krita file and the zoom level of the workspace.



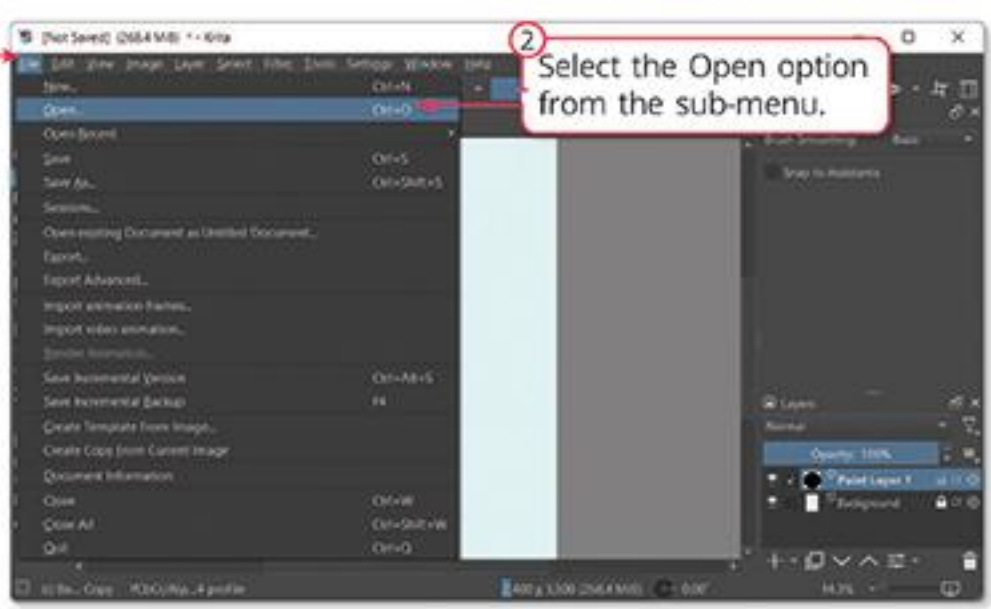
OPEN AN IMAGE

Keyboard Shortcut

To open an image: Ctrl + O

To open an image, follow the given steps:

1. Click on the File menu.
2. Select the Open option from the sub-menu.



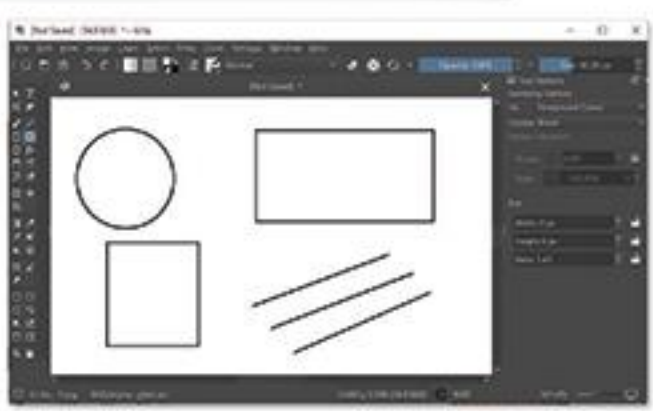
3
Navigate the folder and Select the image, you want to open.
4
Click on the Open button. Selected image will appear on the workspace.
PDF
Open
Cancel

SELECTING AN IMAGE

To edit an image, the first step is to select that image. To select an image, click on the selection tool, then drag the mouse over the image.

DRAWING SHAPES

Krita allows you to draw different shapes using various tools like Line tool, Rectangle tool, Ellipse tool, Polygon tool, etc. To draw a shape, select the desired tool and draw shape on the workspace.



DRAWING FREEHAND

Brushes tool is used to draw freehand on the canvas. Krita provides three types of brush tools: Freehand Brush tool, Dynamic Brush tool and Multibrush tool. To draw freehand, select a tool and draw on the workspace.

LAYERS IN KRITA

In Krita, layers are like sheets of transparent paper stacked on top of each other. Each layer can contain various elements such as drawings, colors, textures, or effects. By using layers, you can work on different parts of your artwork independently, making it easier to edit and manage specific elements. Krita offers several types of layers, each with specific functions and uses:

- **Painting Layers:** These layers are designed for painting and contain the actual artwork.
- **Vector Layers:** Used for creating vector graphics, allowing for non-destructive editing and scaling without loss of quality.
- **Filter Layers:** Apply filters and effects to the layers beneath them, providing a non-destructive way to modify the appearance of your artwork.
- **Group Layers:** Group multiple layers together, making it easier to organize and manage complex compositions.

WORKING WITH LAYERS

Krita allows you to create, delete, duplicate, hide, rename a layer. It also allows you to insert an object on a layer. To start working with layers, click on the Settings tab and click on the Dockers option, then click on the Layers option from the sub-menu.

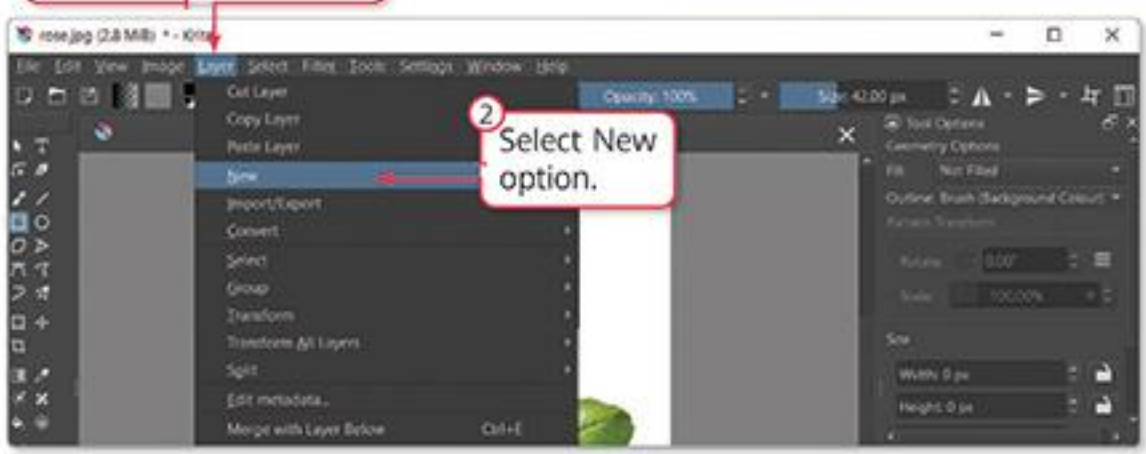
CREATE A NEW LAYER

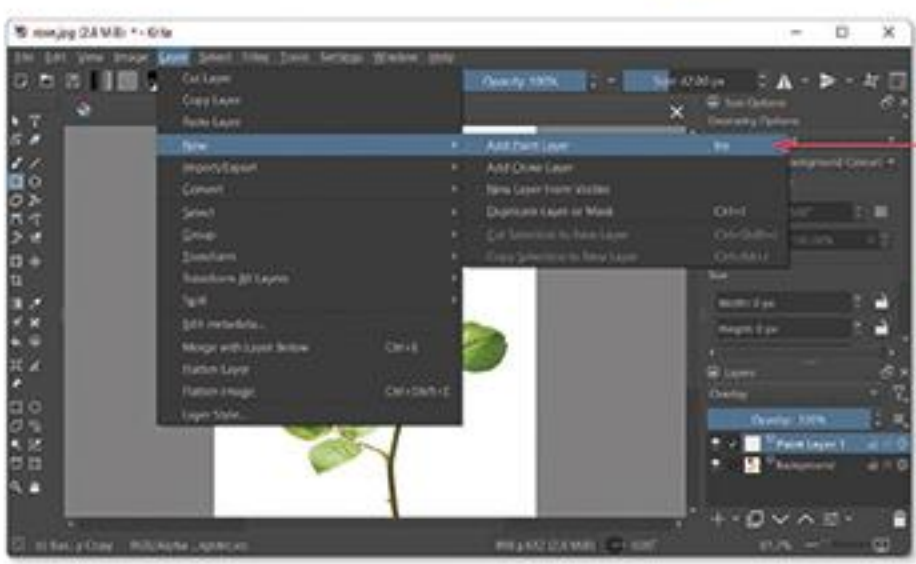
To create a new layer, follow the given steps:

Keyboard Shortcut

To create a new layer: Ctrl + Shift + N

1. Click on the Layers tab on the Menu bar.



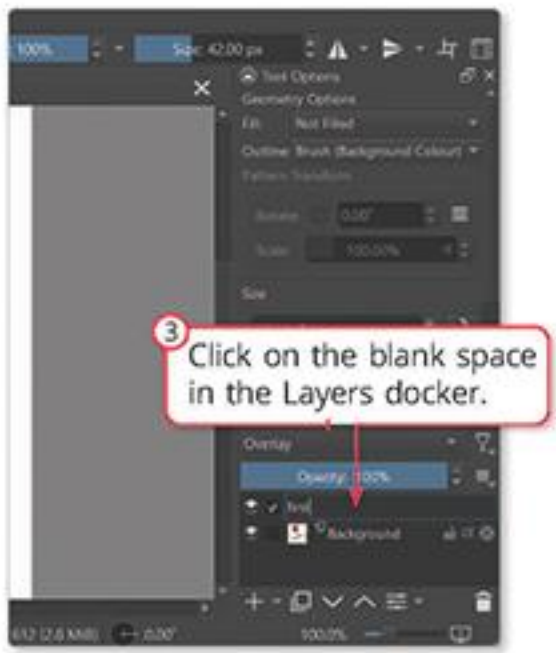


Practical Tip

You can also create a new layer by clicking on the Add Layer button at the bottom left corner of the Layers Docker.

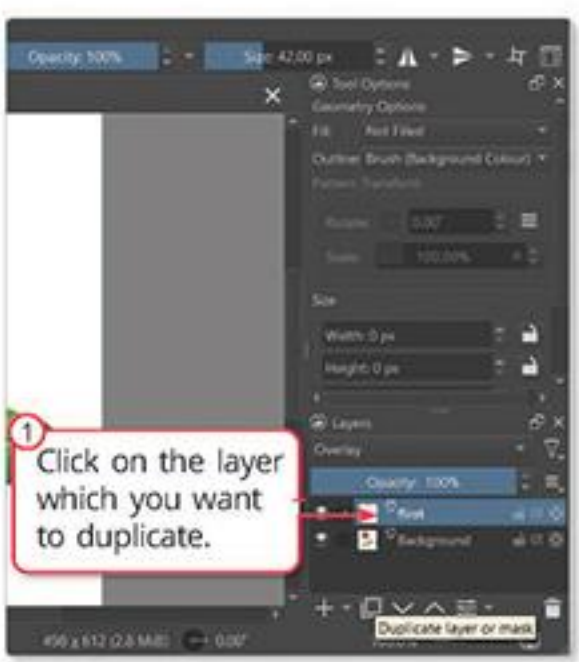
RENAME A LAYER

Krita allows you to rename the layers as per need. To rename a layer, follow the given steps:



DUPLICATE A LAYER

Krita allows you create a duplicate of the existing layer. To duplicate a layer, follow the given steps:



HIDING/SHOWING A LAYER

In Krita, by default, all layers are visible. Krita allows you to hide a layer or show a hidden layer. To hide a layer temporarily, click on the **open-eye-shape** icon and to show a hidden layer, click on the **closed-eye-shape** icon.

Keyboard Shortcut

Ctrl + Tab will switch to the next document. You can also press Ctrl + Shift + Tab to cycle backward through documents.

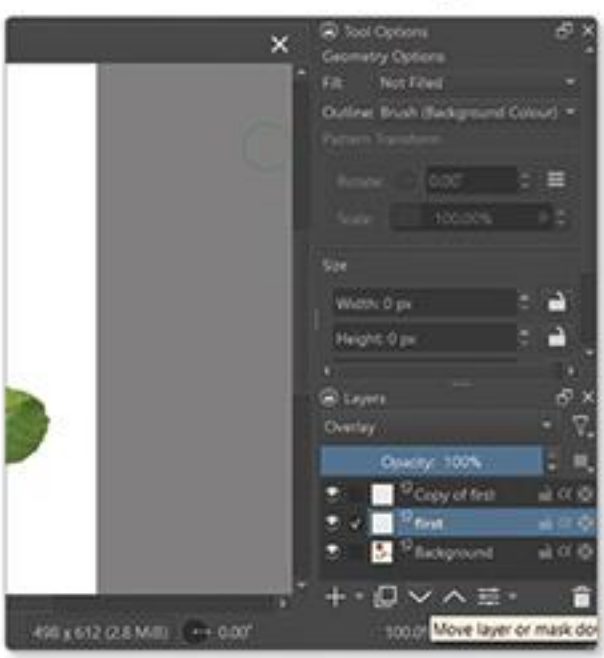
Critical Thinking, information literacy

Spot Check

How do you open Krita?

MOVING A LAYER

Krita allows you to move up and down a layer. To do so, select a layer which you want to move and click on the Move layer or mask up or Move layer or mask down button.



Go & Resolve

Scan the QR code & resolve.

How do you delete a layer in Krita?

Google-It

What are the 5 types of tools in Krita?

DELETE A LAYER

Krita allows you to remove an existing layer. To do so, Select the layer which you want to delete and Click on the Delete the layer or mask button.

Time To Think

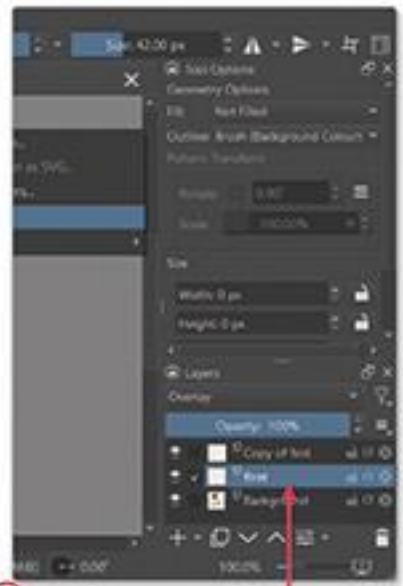
How did people edit images on paper before editing software was developed? Discuss with your teacher.

Practical Tip

Everything in the main menu can be assigned to a shortcut. Custom shortcuts will also appear in the main menu

INSERTING AN OBJECT AS A NEW LAYER

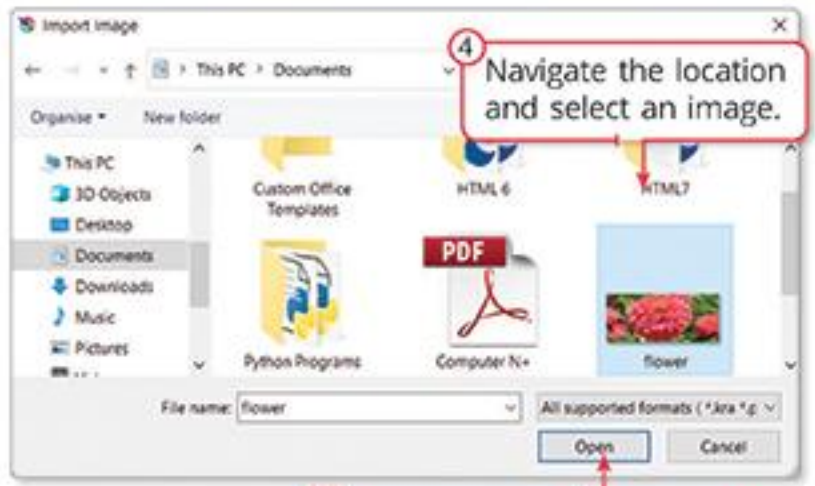
Krita allows you to insert an object as a new layer. To do so, follow the given steps:



3 Click on the Import Layer option from the sub-menu.

Keyboard Shortcut

To Activate the Previous Layer: Press Page down key



4 Navigate the location and select an image.

5 Click on the Open button.

Art Integration

Draw and colour a beautiful rangoli in the given space.

In Summary

- Krita is a free and open source program available on internet.
- To edit an image, the first step is to select that image.
- Brushes tool is used to draw freehand on the canvas.
- In Krita, layers are like sheets of transparent paper stacked on top of each other.
- Krita allows you to create, delete, duplicate, hide, rename a layer.
- Krita allows you create a duplicate of the existing layer.
- To hide a layer temporarily, click on the open-eye-shape icon and to show a hidden layer, click on the closed-eye-shape icon.
- Krita allows you to remove an existing layer.
- Krita allows you to insert an object as a new layer.

EXERCISES

A. Think and Tick (✓) the correct options.

1. What term is related to Krita?

   a. Animation ☐ b. Drawing ☐ c. All of these ☐

2. What is the first step to open an image in Krita?

   a. Click on the File menu ☐ b. Select the Edit option ☐ c. Click on the Save button ☐

3. Which of the following tool is not used for drawing shapes in Krita?

   a. Line tool ☐ b. Ellipse tool ☐ c. Eraser tool ☐

4. Which type of layer allows for non-destructive editing and scaling without loss of quality?

   a. Painting Layers ☐ b. Vector Layers ☐ c. Filter Layers ☐

5. Where can you rename a layer in Krita?

   a. Layer Docker ☐ b. File Layers ☐ c. Edit Layers ☐

6. To remove a layer in Krita, what button do you need to click in the Docker?

   a. Delete layer ☐ b. Rename layer ☐ c. Hide layer ☐

B. Fill in the blanks.

Hints free, three, vectors, rename, selection, layer, hide, open source

1. Krita is a _____ and _____ program available on the internet.
2. Krita has a built-in gallery of _____ that you can use in your drawing.
3. To select an image for editing, you should click on the _____ tool and drag the mouse over the image.
4. Krita provides _____ types of brush tools.
5. In Krita, each _____ can contain various elements such as drawings, colors, textures, or effects.
6. In Krita, to _____ a layer, you should double-click on the name of the layer in the Layers docker.
7. In Krita, to _____ a layer temporarily, click on the open-eye-shape icon.

C. Answer the following questions.

1. Write any two features of Krita?

_____

_____

2. Write any four components of Krita.

_____

_____

3. How do you open an image in Krita?

_____

_____

4. How can you select an image in Krita?

_____

_____

5. What are layers? Also explain their types.

_____

_____

6. How do you move a layer?

_____

_____

7. How do you duplicate a layer in Krita?

8. Write steps to insert an object as a new layer in Krita?

COMPETENCY BASED QUESTION...

Critical Thinking, Digital Literacy

Ritika is creating a digital drawing on nature in Krita. She wants to add the same layer again in her drawing. How will she do this easily and quickly?

Brain Test

Critical Thinking, Computational Thinking

Find mistakes in the given statements and rewrite the correct statements.

1. Krita doesn't allow you to create, delete, duplicate, hide, rename a layer.
2. In Krita, to hide a layer, click on the closed-eye-shape icon.
3. Import/Export option is found under the Edit menu.
4. Painting Layers are designed for creating word files.
5. Brushes tool is used to draw freehand on the canvas.
6. To edit an image, the first step is to rename that image.

Brain Storming

Social Interaction, Communication

Organise a group discussion on the Layers of Krita.

Activity

Creativity, Collaboration

In the word search, find 8 words related to the chapter.

P	Y	D	U	P	L	I	C	A	T	E	N
T	V	H	L	T	S	W	I	K	B	F	O
E	N	D	W	K	V	I	Z	A	V	U	M
W	O	R	K	S	P	A	C	E	S	I	U
F	T	A	J	B	D	W	F	Y	P	K	L
R	F	W	V	X	G	L	A	Y	E	R	T
E	A	I	T	Z	B	Q	R	S	P	I	I
E	T	N	Z	P	C	D	T	S	E	T	B
H	B	G	Y	R	A	C	U	N	Q	A	R
A	E	N	R	Y	V	Q	A	N	Z	A	U
N	C	T	O	Z	U	J	X	T	Z	V	S
D	O	C	K	E	R	W	S	S	J	G	H

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Open Krita software and create a new document.
2. Draw any four shapes on workspace.
3. Save file with name Shapes.
4. Create a new document again and open an image.
5. Create a new layer and give the desired name for the layer.
6. Create a duplicate layer.
7. Remove any unwanted layer.
8. Save the file and exit Krita properly.

Teacher's Note

1. Discuss the interface of Krita to the students.
2. Explain how to draw shapes in Krita.
3. Explain about the Layers and their features in detail.

4 Animation in Krita

Information Literacy, Collaboration, Critical Thinking

Warm Up

Fill in the blanks to insert an object as a new layer.

1. Click on the _____tab.
2. Select the _____ option.
3. Click on the _____option from the sub-menu.
4. Navigate the location and select an image.
5. Click on the _____ button.

Also write the steps to create a new layer in Krita:

Learn About

- Animation
- Creating Animation in Krita
- Exit Krita
- Open Animation Workspace
- Export Animation
- Frames
- Save Animation

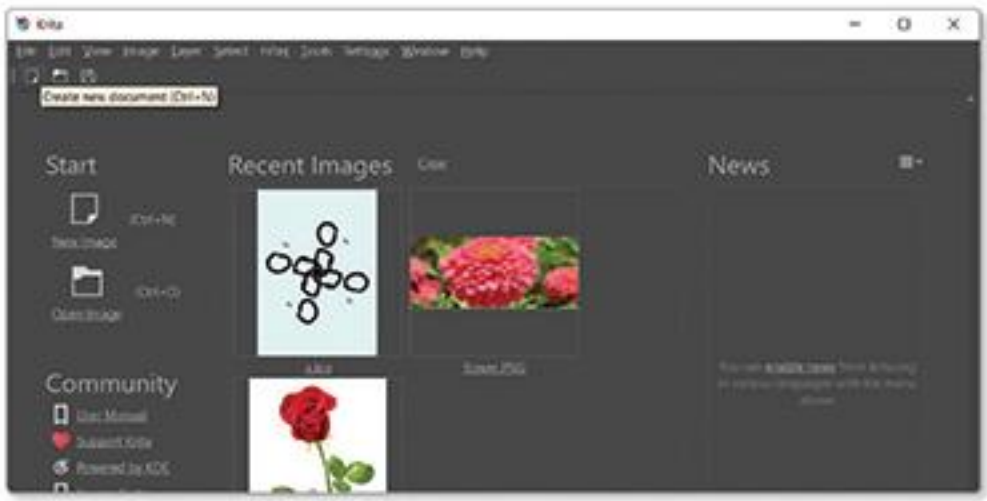
ANIMATION

Animation is the process of creating the illusion of motion and change by displaying a series of images in a sequence. Each frame is slightly different from the previous one, and when these frames are displayed in quick succession, it gives the appearance of movement. Krita is a powerful and easily to use software.

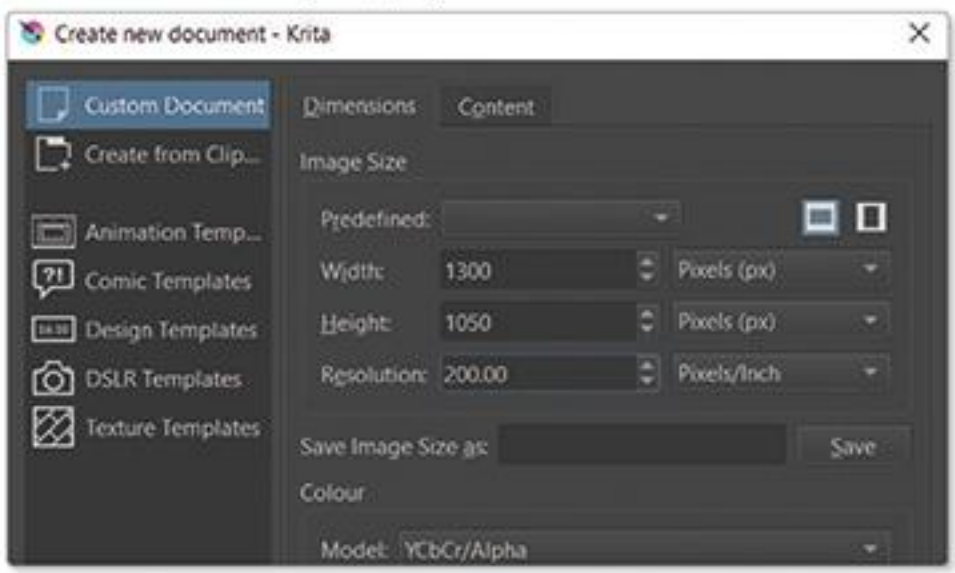
OPEN ANIMATION WORKSPACE

Before creating animation, switch to the animation workspace. To do so, follow the given steps:

Step 1: Click on the Create new document.

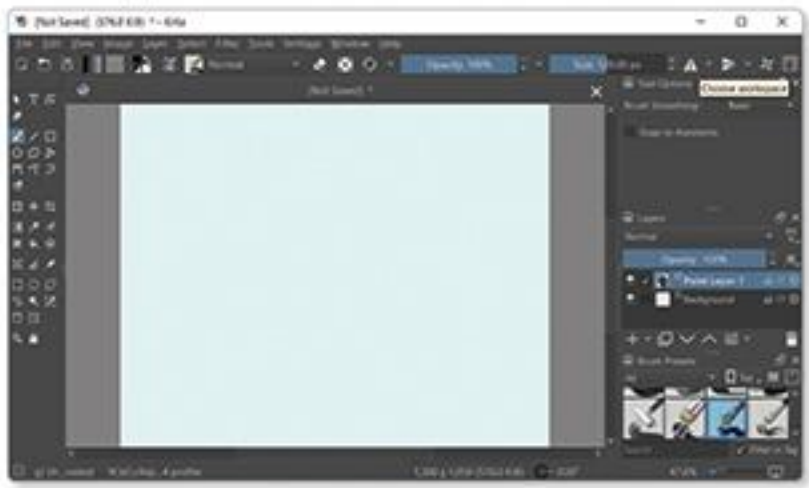


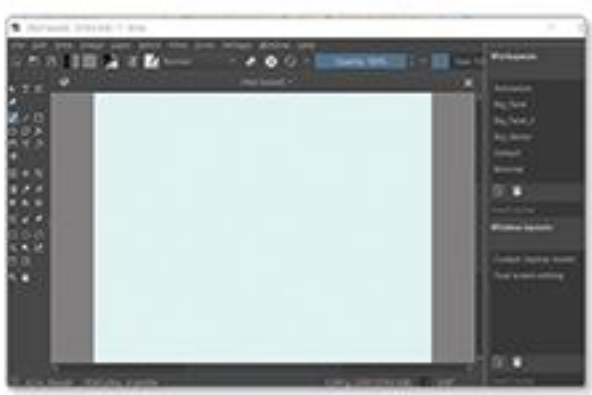
Step 2: Select a canvas size for your project.

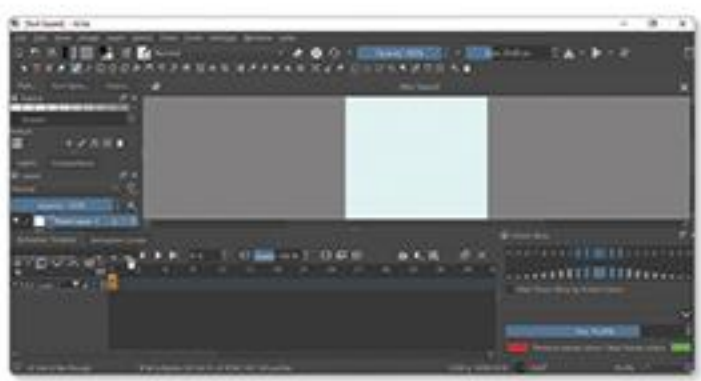


Step 3: Switch to the "Animation" workspace by selecting it from the top-right dropdown menu.

Step 4: Now animation workspace will appear.







Go & Resolve

Scan the QR code & resolve.

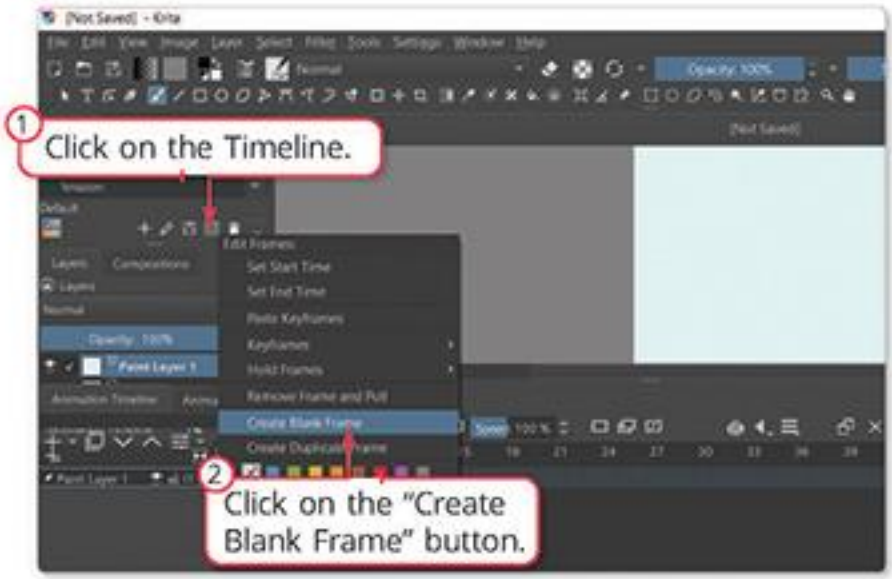
How do you create a frame in Krita?

FRAMES

In Krita, frames refer to individual images or layers that make up an animation sequence. Each frame represents a single "snapshot" of an animation, and when these frames are played in a sequence, they create the illusion of motion.

CREATING A FRAME

To create a new frame, follow the given steps:



WORKING WITH FRAMES

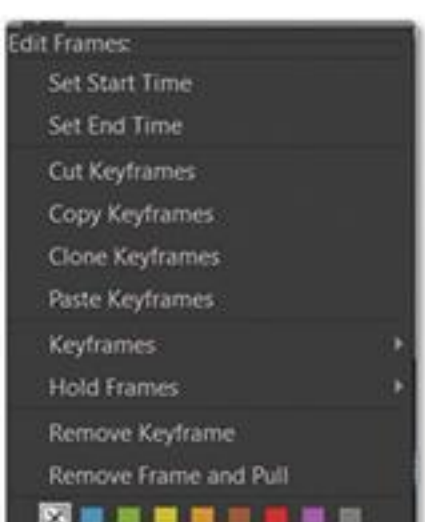
Duplicating Frames: Krita allows you to create duplicate of an existing frame to build the animation. This is useful for maintaining consistency between frames.

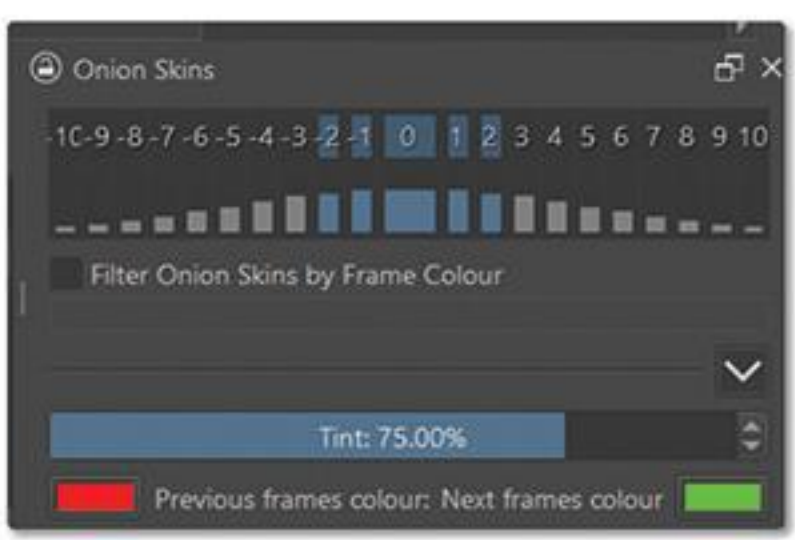
Edit Frames: Krita allows you to do desired changes in each frame to create animation. Make changes to the drawing on each frame to show movement.

Draw on the Frame: Krita allows you to draw on frames using various drawing tools, such as the Brush or Pencil. This becomes the first frame of your animation.

Onion Skin: Onion skinning is a feature that allows you to see the previous and next frames faintly in the background, aiding in smooth transitions.

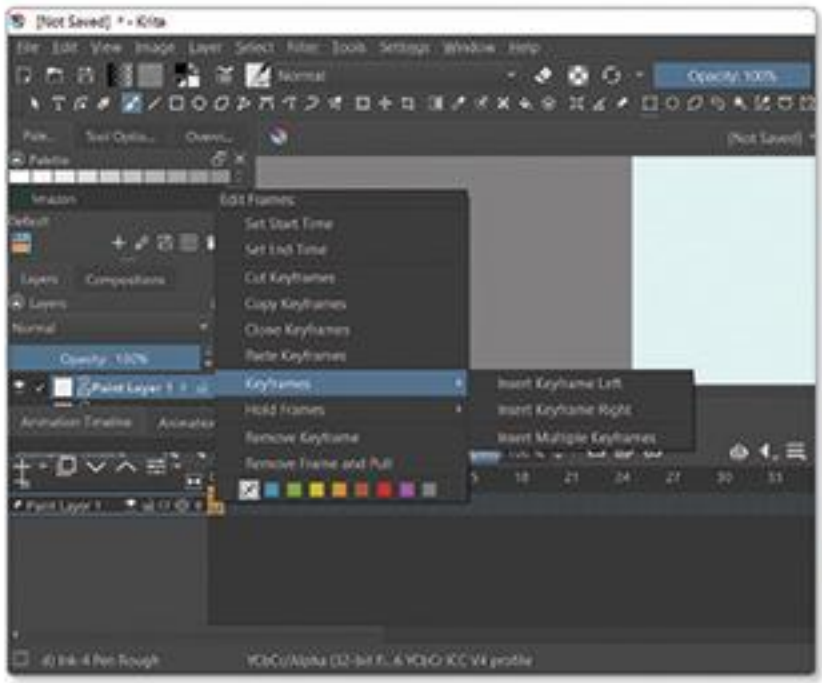
Looping: You can set the number of times your animation loops by selecting "Playback" > "Loop" in the timeline.




Onion Skins
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
Filter Onion Skins by Frame Colour
Tint: 75.00%
Previous frames colour: Next frames colour

KEYFRAMES

Keyframes are crucial in defining the animation's structure. These are drawings or shots that is used to define the starting and ending points of a smooth transition. You can add keyframes to your animation to set specific points in your animation's timeline.



Spot Check

What do you mean by frame editing?

_____

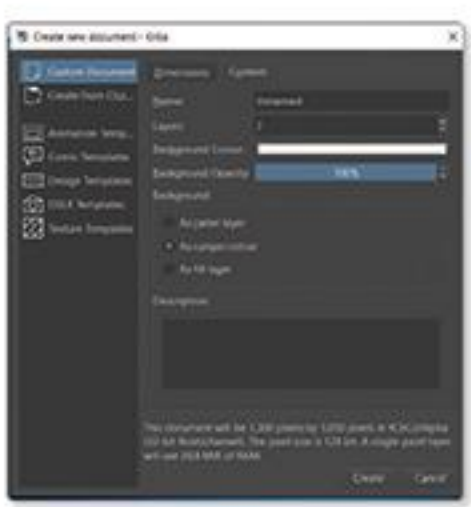
_____

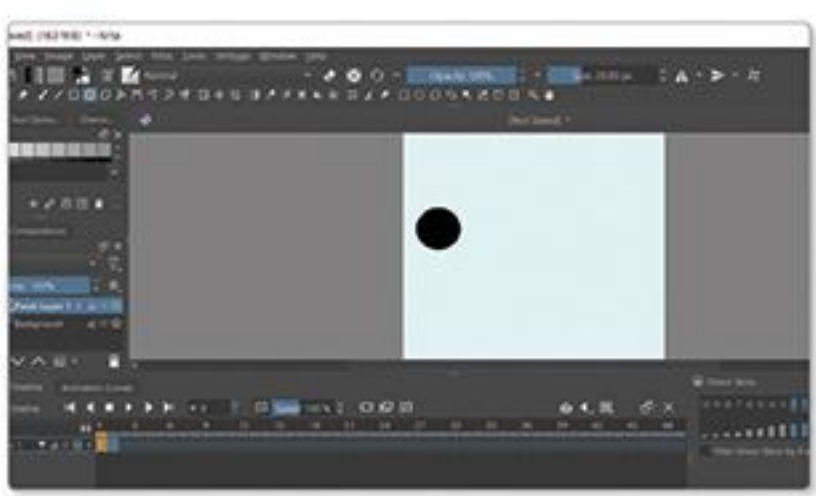
_____

CREATING ANIMATION IN KRITA

To create an animation in Krita, follow the given steps:

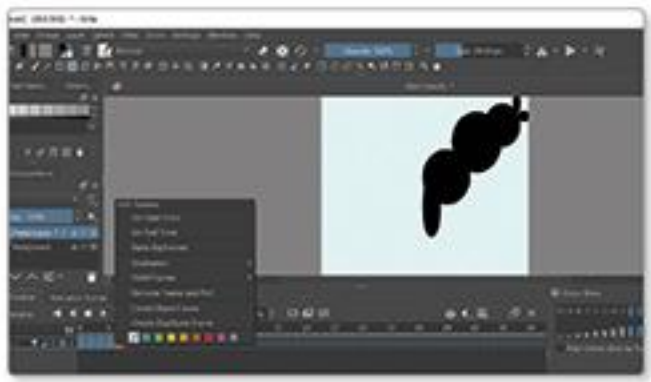
Step 1: Click on the paper icon in the top left-hand corner of the screen to create a new project.





Step 2: Under Custom Document, set the dimensions and DPI.

Step 3: Click on the Content tab and select the option **As canvas color** in the Background menu. Make the desired changes. Click on the **Create** button.



Step 4: Click on the white box at the top-right corner of the window and select **Animation** option from the drop-down menu.

Step 5: Draw a shape using the tools on the first frame.

Step 6: Create more frames and draw shapes to complete a shape.

Step 7: Now create a new frame by clicking on the orange highlighted box then select Create Blank Frame option from the drop-down menu.

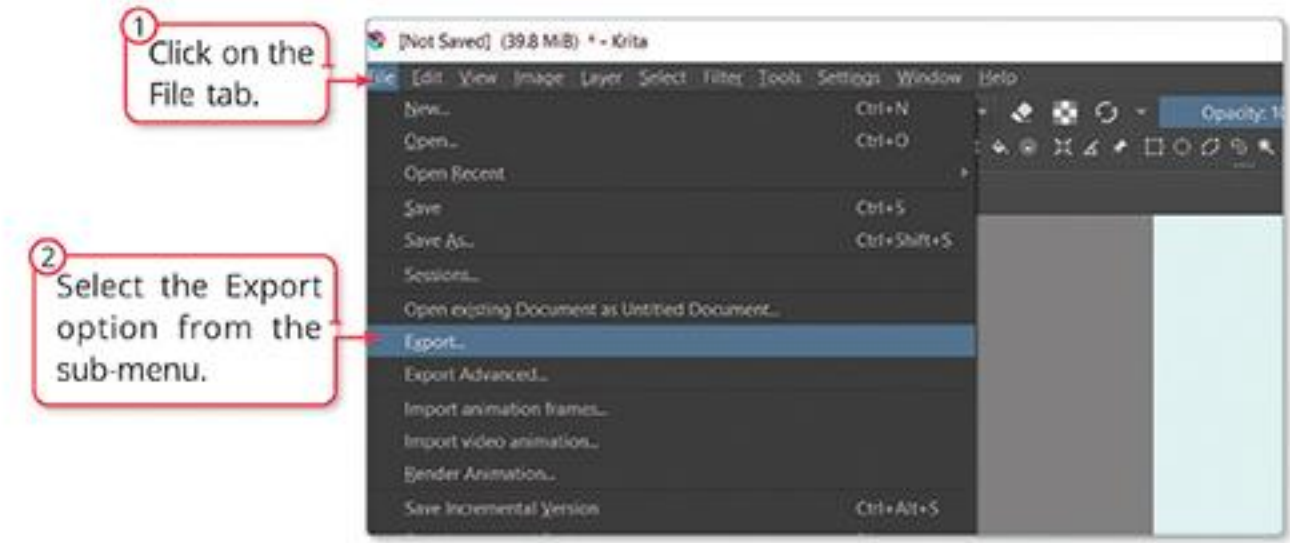
Step 8: Click on the lightbulb icon from the layer to activate the Onion Skin.

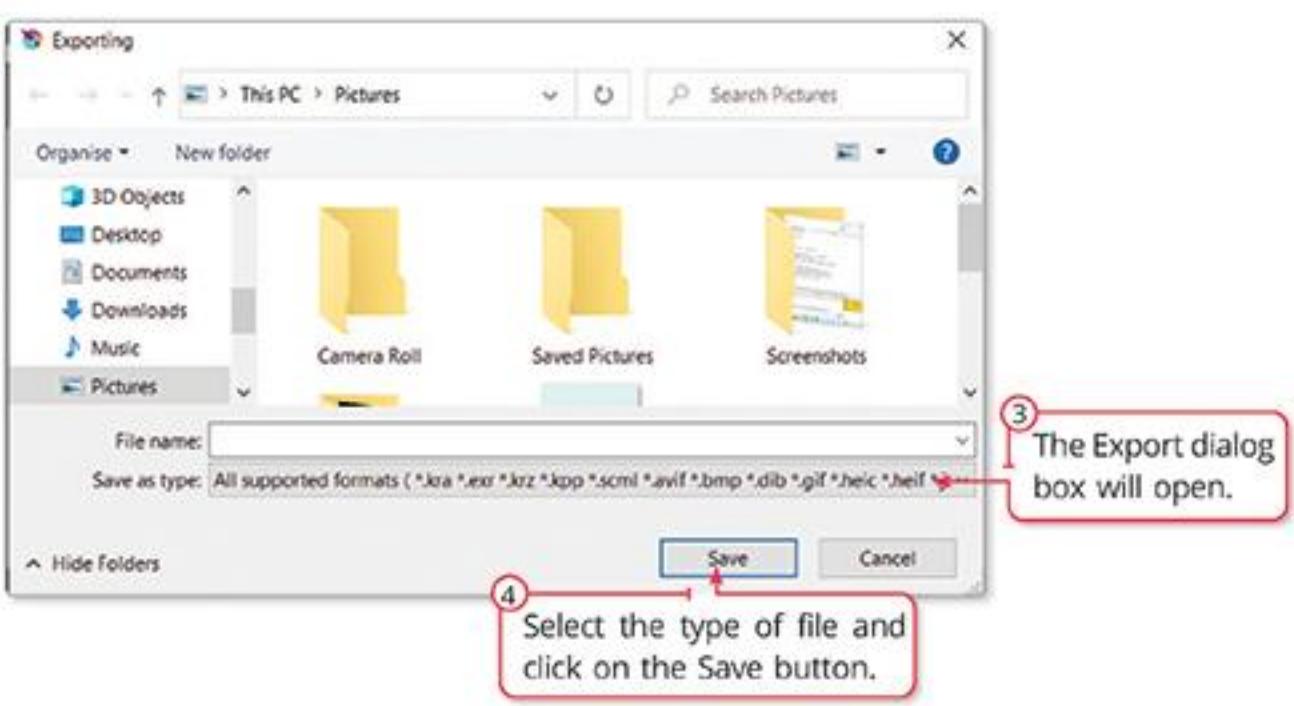
Step 9: Set the speed of the animation by clicking on the arrow up & down icons under the Speed option.

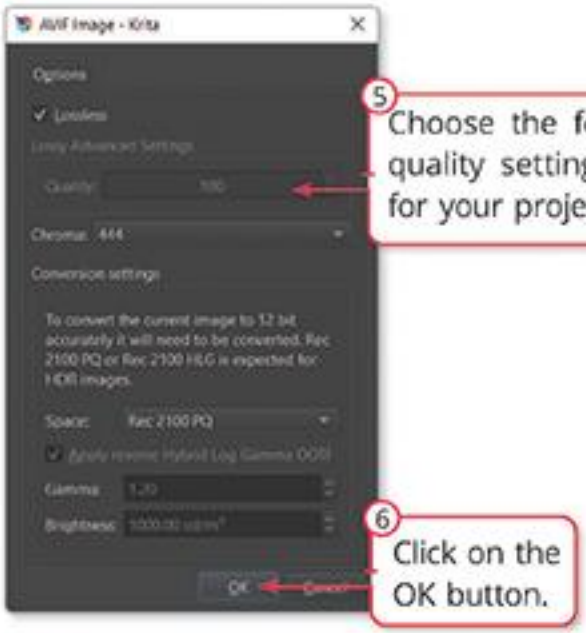
Step 10: To preview your animation, press the "Play" button in the timeline to see how it looks.

EXPORT ANIMATION

Once your animation is complete, you can export it in various formats.







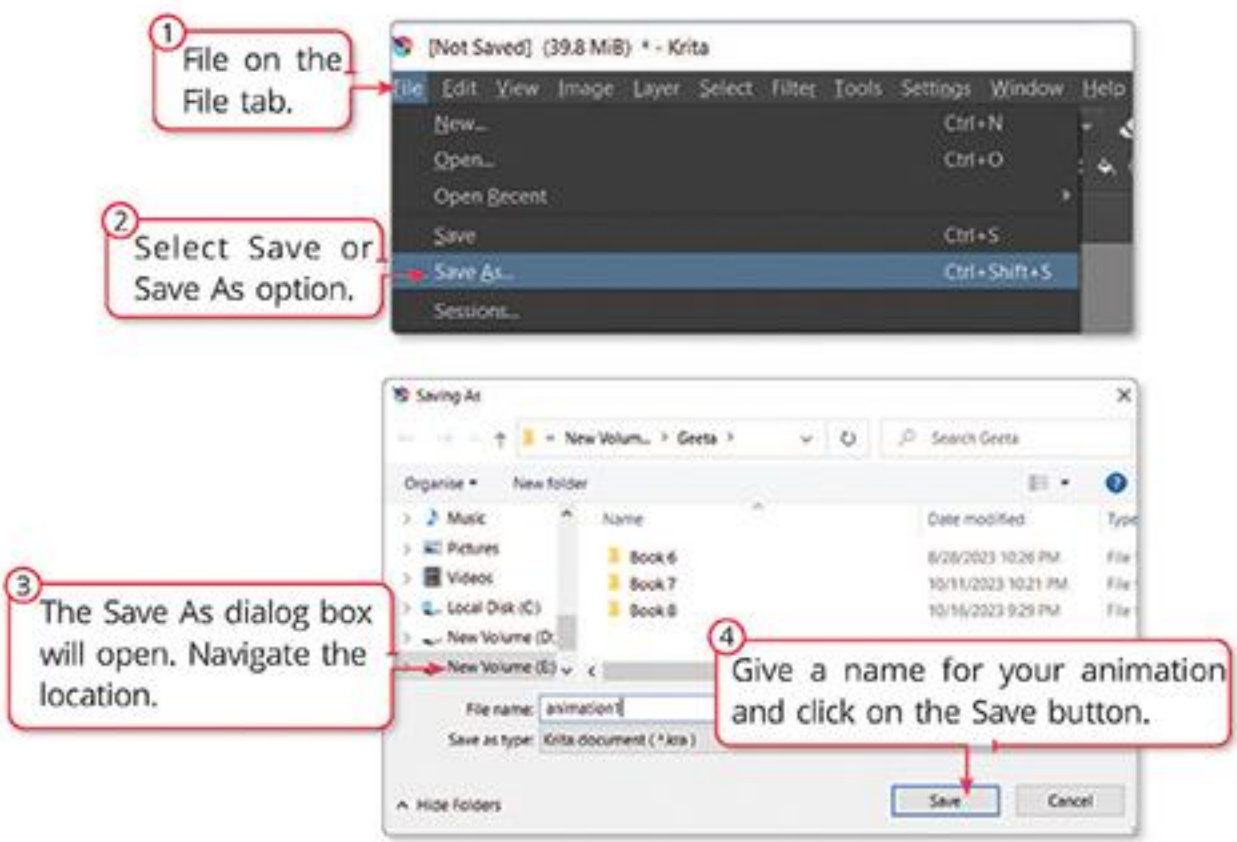
Keyboard Shortcut

To undo: Ctrl+Z

To redo: Ctrl+Shift+Z

SAVE ANIMATION

When you have done work, then save it for future use. To save your animation, follow the given steps:



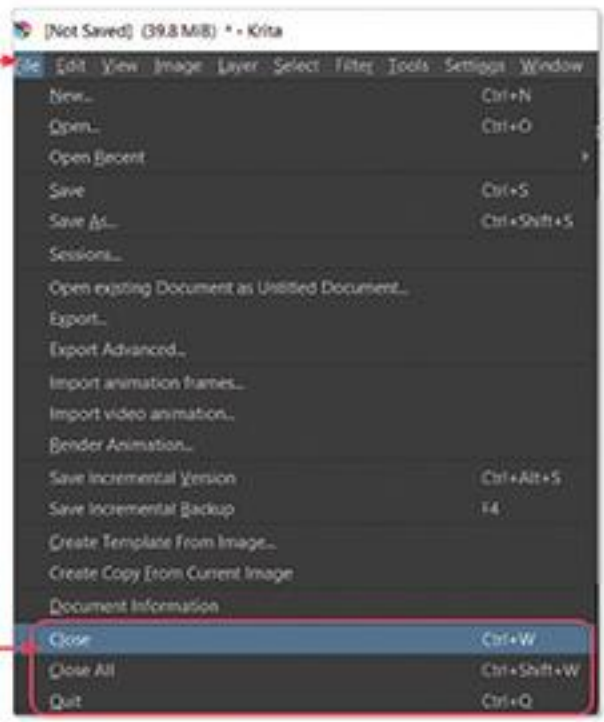
EXIT KRITA

After completing your work, exit from the software. To exit from the Krita, follow the given steps:

Keyboard Shortcut

To quit from Krita: Press Ctrl + Q keys together.

1. Click on the File tab.



2. Select Close/Close All/ Quit option from the drop-down menu.

In Summary

- Animation is the process of creating the illusion of motion and change by displaying a series of images in sequence.
- Switch to the "Animation" workspace by selecting it from the top-right dropdown menu.
- Krita allows you to create duplicate of an existing frame to build the animation.
- Onion skinning is a feature that allows you to see the previous and next frames faintly in the background, aiding in smooth transitions.
- Krita allows you to draw on frames using various drawing tools, such as the Brush or Pencil.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which option allows you to see the previous and next frames faintly in the background?
   a. Onion Skin ☐ b. Frame ☐ c. Skinning ☐
2. Under which tab you can save your document?
   a. Edit ☐ b. Settings ☐ c. File ☐
3. Where you can create a new frame?
   a. Timeline ☐ b. Frames ☐ c. Onion Skin ☐
4. _____ is the process of creating the illusion of motion.
   a. Tools ☐ b. Editing ☐ c. Animation ☐
5. Which option allows you to replicate an existing frame?
   a. Blank Frame ☐ b. Copy Frame ☐ c. Duplicate frame ☐
6. Which of the following is not a drawing tool in Krita?
   a. Brush ☐ b. Pencil ☐ c. Save ☐

B. Write 'T' for true and 'F' for false.

1. Krita is a weak and difficult to use software. _____
2. Krita doesn't allow you to modify a frame. _____
3. You can adjust the speed of animation as per need. _____
4. You can set the dimension and DPI under the Custom Document. _____
5. Krita saves your file with the extension .kra for future use. _____
6. You cannot switch to the "Animation" workspace. _____

C. Answer the following questions.

1. What is animation?

   _____

   _____

2. What is the use of onion skin?

   _____

   _____

3. What do you mean by duplicate a frame?

4. How do you add key frames in Krita?

5. How do you create a blank frame in Krita?

6. What steps you would follow to create an animation in Krita?

7. Write steps to export your animation in Krita.

COMPETENCY BASED QUESTION...

Critical Thinking, Digital Literacy

Riya is creating an animation of LED lights. She wants to create a frame like an existing frame. How can she do this?

Brain Test

Critical Thinking, Computational Thinking

In the word search, find 8 words related to the chapter.

F	R	A	M	E	R	K	L	E	S	S	L
S	M	A	L	A	E	R	Z	H	A	X	O
K	E	Y	F	R	A	M	E	A	V	K	O
I	R	W	Q	A	S	R	G	B	I	R	P
D	U	P	L	I	C	A	T	E	N	I	I
E	X	P	O	R	T	R	R	S	I	T	N
I	N	T	E	R	N	E	O	O	T	A	G
T	I	M	E	L	I	N	E	N	N	Z	N

Brain Storming

Social interaction, Communication

Organise a group discussion on the uses of frames and keyframes in animation.

Life Skills

Self development

Always help students who are weak in coding and development.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Open Krita and create a new document.
2. Now select custom setting for your document and switch to animation workspace.
3. Create an animation to show a bouncing ball on the screen.
4. Save this animation.
5. Export the animation in another format.
6. Exit Krita properly.

Teacher's Note

1. Explain how to create a new document with custom settings in Krita.
2. Demonstrate how to create a simple animation in Krita.
3. Explain the significance of keyframes and onion skin in Krita.

5 Latest IT Trends

Information Literacy, Collaboration, Critical Thinking

Warm Up

Look at these trending app's icons and write their names:

_____

_____

_____

_____

_____

_____

Learn About

- Augmented Reality
- Virtual Reality
- Extended Reality
- 3D printing
- Robotic Process Automation (RPA)
- Block Chain
- Internet of Things (IoT)
- Cloud Computing
- Edge Computing

AUGMENTED REALITY

Augmented Reality (AR) is a cutting-edge technology. It has gained popularity in recent years.

It lays over computer-generated elements onto the user's view of the real world, typically using smartphones, tablets, AR glasses, or other wearable devices. AR enhances the real-world environment by adding digital information or objects seamlessly. AR technology achieves this by using cameras, sensors, and sophisticated algorithms to recognize and track objects and locations in the physical world, allowing for the precise placement of digital content. It redefines how we interact with the world.

KEY COMPONENTS OF AR

Hardware: AR devices come in various forms, from smartphones and tablets to dedicated AR glasses like Microsoft HoloLens or Google Glass. These devices are equipped with cameras, sensors, displays, and processing power necessary for AR experiences.

Blow Your Mind

Augmented reality was invented in 1968.

Software: AR applications rely on some software that integrates real-world data with digital content. It also includes computer vision algorithms for object recognition and tracking.

APPLICATIONS OF AUGMENTED REALITY

AR has various applications across various industries. Some of them are discussed here:

Entertainment: AR is transforming the gaming industry, which overlays virtual creatures on the real world. It also enhances live events and theme park experiences with interactive elements.

Education: AR is used in educational settings to make learning more engaging and interactive. Students can explore 3D models, historical recreations, and immersive simulations.

Healthcare: Surgeons use AR to enhance precision during surgery by overlaying critical patient information. It's also used for medical training and patient education.

Industrial and Manufacturing: AR is used for maintenance and repair tasks, providing workers with step-by-step instructions and real-time data.

Navigation: AR navigation apps like Google Maps' Live View overlay directions onto the real world, making it easier to find your way in unfamiliar places.

Marketing and Advertising: Brands use AR to create interactive and immersive marketing campaigns, allowing consumers to engage with products before purchasing.

BENEFITS OF AR

- Enhanced User Experience
- Training and Simulation
- Healthcare Advancements
- Enterprise and Industry
- Education Transformation

VIRTUAL REALITY

Virtual Reality refers to a computer-generated simulation of an interactive 3D environment that users can engage with through specialised hardware and software. Unlike the real world or Augmented Reality (AR), which overlays digital content onto the physical world, VR replaces the user's physical surroundings entirely with a computer-generated environment. VR aims to create a convincing sense of presence, where users feel like they are physically present in the virtual world, even though they are aware that it is a digital simulation.

Experiential Learning

What is VPS in augmented reality?

Fact Zone

Nearly 70% of VR headset owners use the device for gaming.

KEY COMPONENTS OF VR

Hardware: VR hardware includes headsets or HMDs (Head-Mounted Displays) like the Oculus Rift, HTC Vive, or PlayStation VR. These devices typically consist of high-resolution displays, sensors, and headphones to provide an immersive experience.

Software: VR software includes computer-generated environment, applications, and experiences. It encompasses 3D modelling, rendering engines, and interactive elements that enable users to navigate and interact with the virtual world.

Input Devices: To interact with the virtual environment, users often use hand controllers or gloves equipped with sensors. Some advanced VR systems incorporate full-body tracking and feedback devices to enhance immersion.

APPLICATIONS OF VIRTUAL REALITY

VR has various applications across various industries. Some of them are discussed here:

Gaming: VR gaming offers unparalleled immersion, enabling players to step into the game world and interact with it.

Education and Training: VR is used for educational simulations, enabling students to explore historical sites, and undergo realistic training in fields like aviation, medicine, and military.

Healthcare: VR has applications in therapy, pain management, and rehabilitation. It is used to treat phobias, Post-traumatic stress disorder, and chronic pain. Surgeons also use VR for preoperative planning and training.

Architecture and Design: Architects and designers use VR to create immersive walkthroughs of buildings, interior designs, and urban planning projects, allowing clients to visualize concepts better.

Entertainment and Media: VR is transforming the entertainment industry, offering immersive experiences in movies, concerts, and virtual theme parks.

Tourism and Travel: VR enables virtual tourism, allowing users to explore distant destinations or historical sites from the comfort of their homes.

Social Interaction: Social VR platforms like Oculus Venues provide opportunities for people to meet, socialize, and collaborate in virtual spaces.

Google-It

Who invented first VR device?

FUTURE OF VIRTUAL REALITY

Virtual Reality has the potential to revolutionise several aspects of our lives:

Telecommuting and Remote Collaboration: VR can make remote work and collaboration more immersive and effective, reducing the need for physical presence.

Therapy and Rehabilitation: VR will continue to play a significant role in healthcare, aiding in physical and psychological therapies.

Education and Training: VR will transform education, making learning more engaging and accessible to a global audience.

Entertainment and Media: VR will offer new forms of storytelling and entertainment, creating unique and immersive experiences.

E-commerce and Retail: VR can enhance the online shopping experience by allowing customers to try products virtually before purchasing.

Architectural and Urban Planning: VR will streamline the design and planning processes in architecture and urban development.

EXTENDED REALITY

Extended Reality (XR) represents a spectrum of technologies that encompass Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). XR extends the boundaries of human perception by seamlessly merging the physical and digital worlds. It offers a spectrum of experiences that range from fully immersive to subtly augmented.

THE XR SPECTRUM

Virtual Reality (VR): VR immerses users in entirely digital environments, blocking out the physical world. Users wear headsets to engage with a simulated reality, making it ideal for gaming, simulations, and immersive storytelling.

Augmented Reality (AR): AR overlays digital content onto the real world, enhancing the user's perception of their surroundings. It is commonly used in smartphone apps, smart glasses, and heads-up displays, offering practical applications in fields like navigation, education, and remote assistance.

Time To Think

What do you think about how the 'Telesphere Mask,' as the first VR headset, may have influenced the future of virtual reality and immersive technologies?

Mixed Reality (MR): MR is the convergence of the physical and virtual worlds. It allows virtual objects to interact with the real environment and vice versa. Users can see and manipulate both real and digital elements simultaneously, opening doors to innovative applications in various domains.

APPLICATIONS OF XR

Extended Reality is transforming numerous industries and aspects of daily life, fostering innovation, and creating new opportunities. Here are some applications are given:

Gaming and Entertainment: VR gaming has gained immense popularity, providing players with immersive and interactive experiences. AR enhances entertainment by adding digital layers to live events and broadcasts.

Healthcare: XR aids in medical training, surgery planning, and telemedicine. Surgeons can use MR to overlay patient data during procedures, and VR can be applied for pain management and therapy.

Education: XR brings learning to life by enabling interactive 3D models, virtual field trips, and historical reconstructions. Students can explore concepts in a more engaging way.

Architecture and Design: Architects and designers can use XR to visualize and work on projects more efficiently. Clients can take virtual tours of properties before construction begins.

Manufacturing and Training: XR enhances industrial training and assembly processes. Workers can receive real-time instructions and support, reducing errors and increasing productivity.

Retail: AR enables customers to try products virtually, such as trying on clothes or placing furniture in their homes before purchasing. This improves the shopping experience and reduces returns.

FUTURE POSSIBILITIES OF XR

The future of Extended Reality holds tremendous promise, driven by ongoing technological advancements and evolving user expectations:

Hardware Evolution: XR devices will become more compact, powerful, and affordable. This will broaden accessibility and encourage widespread adoption.

5G Connectivity: The rollout of 5G networks has significantly enhance XR experiences. It provides low-latency, high-bandwidth connections, seamless streaming of complex XR content and real-time collaboration.

Artificial Intelligence Integration: AI play a pivotal role in XR, enabling improved object recognition, natural language processing, and personalized content creation. AI-driven XR applications will become smarter and more intuitive.

Enterprise Adoption: Businesses will increasingly leverage XR for remote collaboration, training, design, and marketing. XR solutions will drive productivity gains and cost savings across industries.

3D PRINTING

3D printing, also known as additive manufacturing. It is a revolutionary technology that has fundamentally transformed the way we create physical objects. Unlike traditional manufacturing methods that involve subtracting material from a solid block (e.g., machining), 3D printing builds objects layer by layer from digital designs.

PRINCIPLES OF 3D PRINTING

3D printing is a process that involves creating a three-dimensional object by adding material layer by layer. The key principles of 3D printing are as follows:

Digital Design: The process begins with a digital 3D model of the object, typically created using computer-aided design (CAD) software. This digital file serves as the blueprint for the 3D printer.

Layered Printing: The 3D printer interprets the digital design and divides it into thin horizontal cross-sections or layers. The printer then deposits material layer by layer to recreate the object.

Material Deposition: Various materials can be used in 3D printing, including plastics, metals, ceramics, and even biological materials. The choice of material depends on the specific application.

Printing Process: The printing process can vary based on the 3D printing technology being used. Common 3D printing methods include Fused Deposition modelling (FDM), Selective Laser Sintering (SLS), and more.

APPLICATIONS OF 3D PRINTING

3D printing has a wide range of applications into the different industries, some of them are given here:

Prototyping: 3D printing is widely used in product development for rapid prototyping. It allows engineers and designers to quickly create physical prototypes to test and refine their designs.

Customization: 3D printing enables the production of customized and personalized products, including medical implants, dental aligners, and consumer goods like customized phone cases.

Aerospace: The aerospace industry uses 3D printing to manufacture lightweight components with complex geometries, reducing the weight of aircraft and spacecraft.

Healthcare: In healthcare, 3D printing is used for creating patient-specific implants, prosthetics, dental restorations, and even tissues and organs through bioprinting.

Automotive: Automotive companies utilize 3D printing for rapid prototyping, producing custom parts, and even manufacturing end-use components, like interior trim pieces.

Architecture and Construction: Large-scale 3D printers can create building components, reducing construction time and waste.

Fashion and Jewellery: Designers and jewellers use 3D printing to create intricate and unique pieces.

IMPACTS OF 3D PRINTING

3D printing has significant impacts on various aspects of society and the economy:

Customisation and Personalisation: 3D printing allows for highly customised and personalised products, catering to individual preferences and needs.

Reduced Waste: Traditional manufacturing often generates significant material waste, whereas 3D printing is more resource efficient. It only uses the material needed for the object being printed.

Supply Chain Disruption: 3D printing has the potential to disrupt traditional supply chains by enabling localized and on-demand production.

Medical Advancements: 3D printing has revolutionized healthcare with patient-specific implants, prosthetics, and the potential to create functional tissues and organs.

Innovation: The technology encourages innovation and rapid iteration in product development, making it easier for startups and inventors to bring their ideas to life.

Education: 3D printing is becoming increasingly integrated into education, providing students with hands-on experience in design and manufacturing.

FUTURE OF 3D PRINTING

Bioprinting: Advances in bioprinting may enable the creation of functional human organs, revolutionizing organ transplantation and medical treatments.

Space Exploration: 3D printing could play a critical role in future space missions by enabling on-site manufacturing of essential components and tools.

Sustainability: 3D printing can contribute to sustainable manufacturing by reducing material waste and energy consumption.

Artificial Intelligence Integration: AI may enhance 3D printing by optimizing designs and processes for greater efficiency and performance.

Consumer Adoption: As 3D printers become more accessible and user-friendly, they may find a place in more households, allowing for personalized, on-demand production of everyday items.

ROBOTIC PROCESS AUTOMATION (RPA)

Robotic Process Automation (RPA) is a powerful tool that is revolutionizing how businesses operate by automating repetitive tasks and workflows. RPA robots mimic human actions by interacting with digital systems and applications, making them a valuable tool for streamlining workflows, reducing errors, and increasing operational efficiency.

KEY COMPONENTS OF RPA

Robots: RPA robots are machines with software programmes capable of mimicking human interactions with computer systems, such as data entry, form filling, and data extraction.

Orchestration and Control: RPA systems include orchestration tools that manage and schedule robot tasks, ensuring proper execution and monitoring.

User Interface (UI): RPA robots can interact with the UI of various applications, just like a human user, enabling them to navigate through software systems seamlessly.

Process Designer: RPA platforms typically offer visual process design interfaces, allowing users to create automation workflows without extensive coding knowledge.

APPLICATIONS OF RPA

RPA has found applications across various industries, some of them are discussed here:

Finance and Accounting: RPA streamlines invoicing, payroll processing, and reconciliations, reducing errors and improving compliance.

Customer Service: RPA bots handle routine customer inquiries, process requests, and assist in resolving issues, leading to faster response times and improved customer satisfaction.

Human Resources: RPA automates HR processes such as onboarding, benefits administration, and employee data management, ensuring accuracy and compliance.

Healthcare: RPA helps healthcare providers manage patient records, claims processing, and billing, reducing administrative burdens and improving patient care.

Supply Chain and Logistics: RPA optimizes inventory management, order processing, and shipment tracking, leading to more efficient operations.

Manufacturing: RPA robots can control and monitor machinery, perform quality checks, and manage inventory in manufacturing settings.

FUTURE OF ROBOTIC PROCESS AUTOMATION

Cognitive Automation: RPA is evolving to incorporate AI and machine learning capabilities, enabling bots to handle unstructured data, make decisions, and learn from experience.

Hyper-automation: Organizations are increasingly adopting a holistic approach to automation, combining RPA with other technologies like process mining, AI, and analytics to create end-to-end automation solutions.

Integration with IoT: RPA can be integrated with the Internet of Things (IoT) to automate actions based on real-time sensor data, enabling responsive and autonomous systems.

RPA as a Service: Cloud-based RPA services are becoming more prevalent, allowing organizations to scale automation initiatives without the need for on-premises infrastructure.

Enhanced Analytics: RPA platforms will offer advanced analytics and reporting capabilities to provide insights into process performance and identify opportunities for further optimization.

Ethical and Regulatory Considerations: As RPA becomes more integrated into business processes, ethical considerations related to job displacement, data privacy, and compliance will require attention and regulation.

BLOCKCHAIN

Blockchain is a decentralized and distributed digital technology. It records transactions across multiple computers in a way that ensures the integrity, security, and immutability of data. Unlike traditional centralized systems, where a single entity has control, blockchain operates on a network of nodes, making it resistant to manipulation and fraud.

KEY CONCEPTS OF BLOCKCHAIN

Decentralization: Blockchain operates on a network of computers (nodes), with no central authority. This ensures that no single entity has control over the system.

Cryptography: Transactions on a blockchain are secured using cryptographic techniques, making it extremely difficult for unauthorized parties to alter data.

Immutable Ledger: Once a transaction is recorded on the blockchain, it cannot be altered or deleted. This immutability enhances the trustworthiness of the data.

Consensus Mechanisms: Blockchain networks use consensus algorithms like Proof of Work (PoW) and Proof of Stake (PoS) to validate and agree upon transactions, ensuring consensus among participants.

APPLICATIONS OF BLOCKCHAIN

Finance: Cryptocurrencies are the most well-known application of blockchain in finance, but it also improves cross-border payments, trade finance, and reduces fraud.

Supply Chain: Blockchain enables end-to-end visibility and traceability of products in the supply chain, reducing counterfeiting and improving transparency.

Healthcare: Patient records can be securely stored and shared on a blockchain, ensuring data integrity and privacy while enabling efficient data exchange.

Smart Contracts: Self-executing smart contracts on blockchain automate and enforce contract terms, reducing the need for intermediaries in legal and financial agreements.

Voting Systems: Blockchain can enhance the security and transparency of voting systems, reducing the risk of election fraud.

Real Estate: Property transactions can be recorded on a blockchain, simplifying the process, and reducing fraud in real estate deals.

Google-It

What are some areas where the concept of blockchain technology can be useful?

FUTURE OF BLOCKCHAIN

The future of blockchain holds several promising developments, some of them are given here:

Scalability Solutions: Efforts to improve the scalability of blockchain networks will enable them to handle a greater volume of transactions, making them more practical for mainstream adoption.

Interoperability: Blockchain platforms are working towards greater interoperability, allowing different networks to communicate and share data seamlessly.

Tokenization of Assets: Assets like real estate, art, and even intellectual property are likely to be represented as digital tokens on blockchain, making them more liquid and accessible.

Central Bank Digital Currencies (CBDCs): Central banks around the world are exploring the issuance of digital currencies on blockchain to enhance the efficiency of monetary systems.

Manufacturing: IoT sensors on machines and equipment enhance predictive maintenance, reducing downtime and optimizing production.

Agriculture: IoT-based precision farming optimizes crop management, irrigation, and livestock monitoring for increased yields and sustainability.

Smart Cities: IoT solutions for transportation, waste management, and infrastructure improve urban living through increased efficiency and reduced environmental impact.

Logistics and Supply Chain: IoT sensors track shipments, monitor inventory, and optimize routes, improving the efficiency and transparency of supply chains.

Google-It

Explore and list a few IoT devices available in the market.

Art Integration

Draw and colour any two-favourite devices. Also write their features.

FUTURE OF IOT

The future of IoT holds several exciting developments and trends, some of them are discussed here:

5G Connectivity: The rollout of 5G networks will significantly enhance IoT capabilities, enabling faster data transmission and lower latency.

Edge Computing: IoT devices are increasingly equipped with edge computing capabilities, enabling data processing at the device level, reducing latency, and enhancing privacy.

AI Integration: AI and ML play a crucial role in IoT, enabling devices to make more informed decisions, improve automation, and provide advanced analytics.

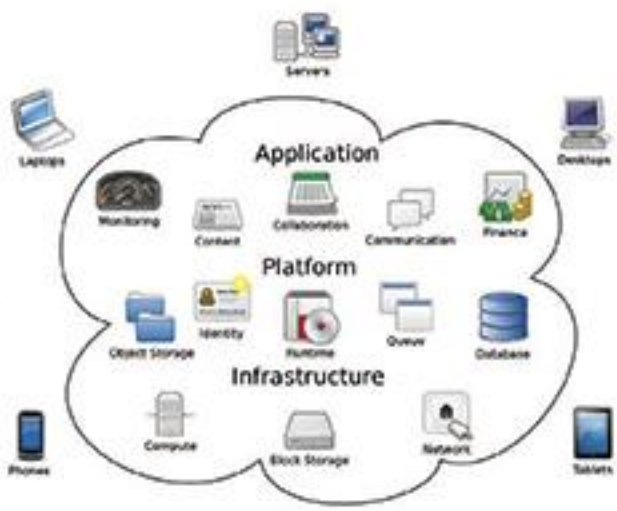
IoT Security: As the number of IoT devices grows, security will become a paramount concern. Stronger authentication, encryption, and device management will be critical.

Interoperability: Standards and protocols that enable different IoT devices to communicate seamlessly will gain importance as ecosystems expand.

Environmental Sustainability: IoT will contribute to sustainability efforts by enabling more efficient resource management, reducing waste, and minimizing energy consumption.

CLOUD COMPUTING

Cloud computing is a revolutionary technology that has transformed the way individuals and businesses access, store, process, and manage data and applications. Instead of relying on local servers or personal devices, cloud computing utilizes remote servers hosted on the internet to provide a wide range of computing services, from data storage to powerful computing resources, accessible from anywhere with an internet connection.



KEY CHARACTERISTICS OF CLOUD COMPUTING

On-Demand Self-Service: Users can provision and manage resources as needed, without requiring human intervention from the service provider.

Broad Network Access: Cloud services are accessible over the internet, making them available from a variety of devices and locations.

Resource Pooling: Cloud providers pool and allocate resources dynamically, optimizing efficiency and scalability.

Rapid Elasticity: Cloud resources can be quickly scaled up or down to accommodate changing demands, ensuring cost-effectiveness.

CLOUD SERVICE MODELS

Cloud computing offers various service models, catering to different business needs:

Google-It

Which is the largest data centre of Microsoft in India?

Infrastructure as a Service (IaaS): Provides virtualized computing resources over the internet, such as virtual machines, storage, and networking. Users have control over the operating system and applications.

Platform as a Service (PaaS): Offers a platform with development tools and services for building, testing, and deploying applications. Users can focus on coding and application logic, while the cloud provider manages the infrastructure.

Software as a Service (SaaS): Delivers software applications over the internet on a subscription basis. Users access applications through a web browser, eliminating the need for local installations and maintenance.

CLOUD DEPLOYMENT MODELS

Cloud computing can be deployed in different ways, depending on the organisation's requirements:

Public Cloud: Services are provided by a third-party cloud provider and are accessible over the public internet. Public clouds offer scalability and cost-effectiveness but may have security and privacy considerations.

Private Cloud: Operated exclusively for a single organization, a private cloud offers greater control, security, and customization. It can be hosted on-premises or by a third-party provider.

Hybrid Cloud: Combines public and private cloud resources, offering flexibility and the ability to move workloads between environments. It caters to organizations with varying needs for scalability and security.

FUTURE OF CLOUD COMPUTING

The future of cloud computing is marked by several trends and innovations:

Edge Computing: Processing data closer to the source or "edge" of the network to reduce latency and enable real-time decision-making.

Serverless Computing: A model where cloud providers manage infrastructure, automatically scaling resources based on demand, allowing developers to focus solely on code.

Quantum Computing: The integration of quantum computing into cloud services, enabling breakthroughs in cryptography, simulations, and data analysis.

AI and Machine Learning: Cloud platforms will increasingly integrate AI and machine learning tools, making these technologies more accessible to a wider range of applications.

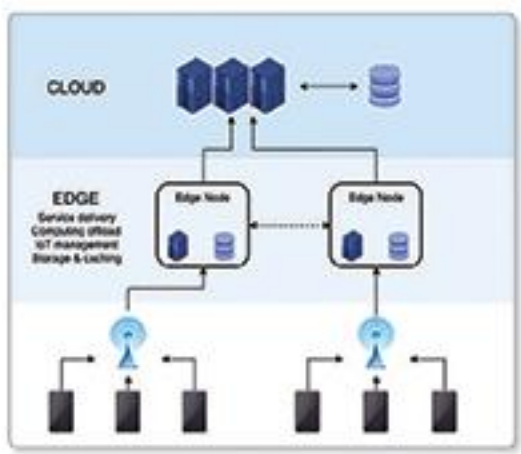
Security and Compliance: Continued focus on enhancing security measures and regulatory compliance to address growing concerns about data protection and privacy.

Spot Check

Fill in the blanks.

1. Cloud providers pool and allocate resources _____ .
2. The rollout of _____ will significantly enhance IoT capabilities.
3. The _____ systems include orchestration tools that manage and schedule robot tasks.

EDGE COMPUTING



Edge computing is a distributed computing paradigm that brings data processing and computation closer to the data source or "edge" of the network, rather than relying solely on centralized cloud servers. This approach aims to reduce latency, enhance real-time decision-making, and improve the efficiency of data transmission by processing data locally or in nearby edge servers.

KEY CONCEPTS OF EDGE COMPUTING

Low Latency: Edge computing reduces the time it takes for data to travel between devices and data centres, enabling quicker responses and real-time applications.

Decentralization: Unlike cloud computing, which centralizes data processing, edge computing disperses computing resources across various edge devices, gateways, and servers.

Data Filtering: Edge devices can filter and preprocess data locally, sending only relevant information to the cloud or data centre, reducing bandwidth usage.

Reliability: Edge computing can enhance the reliability of applications by reducing dependence on a single centralized data centre or cloud provider.

APPLICATIONS OF EDGE COMPUTING

Edge computing has many applications across various industries, enabling new possibilities and improving existing processes:

IoT and Smart Devices: Edge computing enhances the capabilities of IoT devices by enabling real-time data processing and local decision-making.

Autonomous Vehicles: Self-driving cars rely on edge computing to process sensor data quickly, ensuring safe and efficient navigation.

Healthcare: Medical devices and wearables benefit from edge computing for real-time monitoring and timely alerts to healthcare providers.

Manufacturing: Edge computing in manufacturing improves automation, predictive maintenance, and quality control by processing data at the source.

Retail: In-store edge devices can personalize shopping experiences, optimize inventory management, and enhance security.

Telecommunications: Edge computing enables content delivery networks (CDNs) to reduce latency for streaming and online gaming.

FUTURE OF EDGE COMPUTING

The future of edge computing holds several exciting developments, some of them are given here:

5G Integration: The rollout of 5G networks further supports edge computing by providing low-latency, high-bandwidth connectivity.

Fog Computing: An extension of edge computing, fog computing distributes computing resources even closer to the data source, often at the network's edge.

AI and Machine Learning: Edge devices will increasingly incorporate AI and machine learning algorithms for real-time data analysis and decision-making.

Security and Privacy: Enhanced security measures will be critical as edge devices become more prevalent, ensuring data protection and privacy at the edge.

Edge-to-Cloud Orchestration: Efficient coordination between edge devices and cloud resources will be crucial to leverage the strengths of both paradigms.

Energy Efficiency: Innovations in low-power computing and renewable energy sources will make edge devices more energy-efficient and sustainable.

In Summary

- Augmented Reality (AR) is a cutting-edge technology.
- Virtual Reality refers to a computer-generated simulation of an interactive 3D environment.
- Extended Reality (XR) represents a spectrum of technologies that encompass Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR).
- 3D printing is a revolutionary technology that has fundamentally transformed the way we create physical objects.
- RPA is a powerful tool that is revolutionizing how businesses operate by automating repetitive tasks and workflows.
- Blockchain is a decentralized and distributed digital technology.
- The Internet of Things (IoT) is a revolutionary technology paradigm that connects everyday physical objects and devices to the internet.
- Cloud computing is a revolutionary technology that has transformed the way individuals and businesses access, store, process, and manage data and applications.
- Edge computing is a distributed computing paradigm that brings data processing and computation closer to the data source.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which of the following enhances the real-world environment by adding digital information or objects seamlessly?

   a. AR ☐ b. VR ☐ c. XR ☐

2. Which of the following replaces the user's physical surroundings entirely with a computer-generated environment?

   a. AR ☐ b. VR ☐ c. XR ☐

3. Which of the following extends the boundaries of human perception by seamlessly merging the physical and digital worlds?

a. MR ☐ b. VR ☐ c. XR ☐

4. Which of the following is the convergence of the physical and virtual worlds?

a. AR ☐ b. VR ☐ c. MR ☐

5. Which of the following is also known as additive manufacturing?

a. 3D printing ☐ b. Block chain ☐ c. IoT ☐

6. Which of the following is a decentralized and distributed digital technology?

a. 3D printing ☐ b. Block chain ☐ c. Edge Computing ☐

B. Write 'T' for true and 'F' for false.

1. PaaS provides virtualized computing resources over the internet. _____
2. Edge computing can decrease the reliability of applications. _____
3. VR gaming offers unparalleled immersion. _____
4. Blockchain enables end-to-end visibility and traceability of products in the supply chain. _____
5. Cloud computing allows virtual objects to interact with the real environment. _____

C. Answer the following questions.

1. Write key components of VR.

_____

_____

2. What is RPA?

_____

_____

3. Write any four applications of IoT.

_____

_____

4. Write any four future aspects of XR.

_____

_____

5. Explain key concepts of block chain.

6. What do you mean by AR? Also write its benefits.

7. What is cloud computing? write its characteristics also.

8. Explain 3D printing. Also explain any four applications of 3D printing.

Brain Test

Critical Thinking, Computational Thinking

Find eight words related of trending devices.

E	S	A	A	R	P	A	O	M	C	Z	G	R	C
E	D	U	E	T	H	I	G	H	L	A	Y	O	O
E	D	G	E	E	R	Z	X	T	O	V	F	B	M
I	R	M	Q	A	S	R	M	Q	U	X	D	O	P
M	T	E	X	T	E	N	D	E	D	Q	R	T	U
C	I	N	R	U	Y	U	C	X	Z	A	T	I	E
P	T	T	S	M	A	R	T	S	E	N	S	C	R
X	Y	E	I	Q	W	Z	X	C	V	B	I	O	T
R	E	D	L	V	I	R	T	U	A	L	R	N	N

Brain Storming

Social Interaction, Communication

Organise a group discussion on IoT and its applications.

Life Skills

Self development

Never misuse technology for your personal benefits.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Search about more trending devices.
2. Make a presentation on the collected information.
3. Also add pictures of devices.
4. Save your presentation and present it.

Teacher's Note

1. Explain the difference between AR and VR.
2. Discuss about cloud computing and Edge computing.
3. Explain about IoT and RPA in detail.

Worksheet 1

(Based on chapters Chapter 1 to 5)

A. Look at the given images and write their uses.

1. _____

2. _____

3. _____

4. _____

5. _____

B. Label the components of a chart.

C. Fill in the blanks to export an animation in Krita.

1. Click on the _____ tab.
2. Select the _____ option from the sub-menu.
3. The _____ dialog box will open. Select the type of _____ .
4. Click on the _____ button.
5. Choose the _____ and _____ settings suitable for your project.

6. Click on the _____ button.

D. Match the following components with their descriptions.

Column A	Column B
1. Title bar	a. displays a blank area to open and edit a drawing.
2. Menu bar	b. displays the currently selected tools.
3. Toolbox	c. displays options like File, Edit, View, Layers, etc.
4. Workspace	d. displays the name of the program and name of the file.
5. Status Bar	e. displays various image editing tools.
6. Options bar	f. displays the size of the Krita file and the zoom level of workspace.

E. Read the given incorrect statements and rewrite them correctly.

1. Virtual Reality refers to a human-generated simulation of an interactive 1D environment that users can engage with through specialised games.

_____

_____

2. AR is used in educational settings to make learning less engaging and interactive and overlays traditional content onto the real world, enhancing the user's perception of their surroundings.

_____

_____

3. XR extends the boundaries of animal perception by seamlessly merging the physical and artificial worlds.

_____

_____

4. Printing is a revolutionary technology that has fundamentally transformed the way we create virtual objects.

_____

_____

5. Edge computing is a traditional computing paradigm that brings data processing and computation closer to the data source of the network.

_____

_____

F. Rearrange the letters to get the correct words.

1. CAHTR _____
2. NAIMTIANO _____
3. SALYRE _____
4. RFMSAE _____
5. LICBOCKHNA _____

Test Paper 1

(Based on chapters 1 to 5)

A. Think and Tick (✓) the correct options.

1. Which of the following is a backbone of modern communication?
   a. Computer Network ☐ b. Computer system ☐ c. Laptop ☐
2. Hybrid architecture in a combination of _____ .
   a. client-server ☐ b. Peer-to-peer ☐ c. Both a & b ☐
3. Which of the following provides an overall description for the chart
   a. Axis ☐ b. Legend ☐ c. Chart Title ☐
4. Which of the following displays labels or values along the vertical direction?
   a. X-Axis ☐ b. Y-Axis ☐ c. Z-Axis ☐
5. Where can, you rename a layer in Krita?
   a. Layer Docker ☐ b. File Layers ☐ c. Edit Layers ☐
6. Which tool is used to draw a simple and straight line?
   a. Rectangle ☐ b. Square ☐ c. Line ☐
7. Under which tab can you save your document?
   a. Edit ☐ b. Settings ☐ c. File ☐
8. _____ is the process of creating the illusion of motion.
   a. Tools ☐ b. Editing ☐ c. Animation ☐
9. Which of the following is also known as additive manufacturing?
   a. 3D printing ☐ b. Block chain ☐ c. IoT ☐
10. Which of the following is a decentralized and distributed digital technology?
    a. 3D printing ☐ b. Block chain ☐ c. Edge Computing ☐

B. Write 'T' for true and 'F' for false.

1. Link layer protocols focus on routing and forwarding data packets across networks. _____
2. A well-designed architecture incorporates security measures to protect data and resources. _____
3. A Local Area Network is a network limited to a specific geographic area. _____
4. Krita is a weak and difficult to use software. _____

6

Frame and Forms in HTML5

Information Literacy, Collaboration, Critical Thinking

Warm Up

Create HTML codes to create the given webpage.

WATER

Water is a natural resource and important for plants, animals, and humans. It is made up of molecules of oxygen and hydrogen.

Codes:

Learn About

- Frames
- iframe
- Forms in HTML5
- Create a simple form

FRAMES

In HTML, frames are used to divide your browser window into more than one section and each section can load a different HTML document. A frameset is a group of frames that are shown together in the browser window. The window is broken up into frames similar to how tables are organised in rows and columns.

ADVANTAGES OF A FRAME

Some advantages of a frame are given below.

- Frames are used to view multiple documents within a single webpage/web browser window.
- Frames are used to load pages from different servers in a single frameset.
- The outdated browsers that do not support frames can be addressed by the tags.

<FRAMESET> TAG

To create frames in a web browser, we use <frameset> tag instead of <body> tag. The frameset tag is used to define how to divide the browser window into the different frames.

Attributes of <frameset> tag

The <frameset> tag has various attributes, some of them are discussed here.

The cols attribute

When we want to create vertical frames in web browser then, we use cols attribute. The cols attribute is used to define the number of columns and their sizes inside the <frameset> tag.

We can specify the width of each column in the following ways:

- Absolute values in pixels.
- Percentage value.
- Wild card values in percentage

Example: <frameset cols = "30, 80, 60">

<frameset cols = "20%, 35%, 10%">

<frameset cols = "15%, *, 40%, 25%">

Fact Zone

The first web page was created by Tim Berners-Lee in 1991.

The rows attribute

When we want to create horizontal frames in web browser then, we use rows attribute. The rows attribute is used to define the number of rows and their sizes inside the <frameset> tag. We can specify the height of each row in the following ways:

- Absolute values in pixels.
- Percentage value.
- Wild card values in percentage

Example: <frameset rows = "50, 60, 80">

<frameset rows = "20%, 30%, 20%">

<frameset rows = "20%, *, 20%">

Google-It

What are the benefits of iframe?

The border attribute

This attribute is used to define the width of border of each frame. We specify values in pixel and for no border we use zero value.

Example: <frameset border="10" frameset>

The frameborder attribute

This attribute is used to add a border (2D or 3D). We specify two values 0 and 1, where 0 refers to the no border and value 1 refers to a border.

The framespacing attribute

This attribute is used to define the amount of spacing between the frames in a frameset. We specify values in pixel.

Example: <framespacing="50">

Attributes of Frame Tag

name: This attribute is used to give names to the frame. It differentiates one frame from another. It is also used to indicate which frame a document should loaded into.

src: This attribute is used to define the source file that should be loaded into the frame. The value of src can be any url.

Example: <frame name = "left" src = "/html/left.htm" />

marginwidth: This attribute in frame tag is used to specify width of the spaces in pixels between the border and contents of left and right frame.

<frame marginwidth="20">

marginheight: This attribute in frame tag is used to specify height of the spaces in pixels between the border and contents of top and bottom frame.

<frame marginheight="20">

scrollbar: To control the appearance of scroll bar in frame use scrollbar attribute in frame tag. This is basically used to control the appearance of scrollbar. The value of this attribute can be yes, no, auto. The value no denotes there will be no appearance of scroll bar.

<frame scrollbar="no">

Keyboard Shortcut

To open save AS dialog box:
Ctrl + S

You can create similar frames in HTML.

Google-It

When was the first version of html released?

IFRAME

The iframe stands for Inline Frame. The "iframe" tag creates a little box on a webpage where you can show another webpage inside it. It's like a window inside a window, and you can even have scroll bars and borders around it. An iframe is like a tiny window on a webpage that can display another webpage inside the main one. It's a way to include a separate document within the current webpage.

Syntax:

<iframe src="URL" title="description"></iframe>

In iframe, it contains single value i.e., URL. There are two types of URL links:

- **Absolute URL:** Refer to another webpage.

- **Relative URL:** refer to other files of the same webpage.

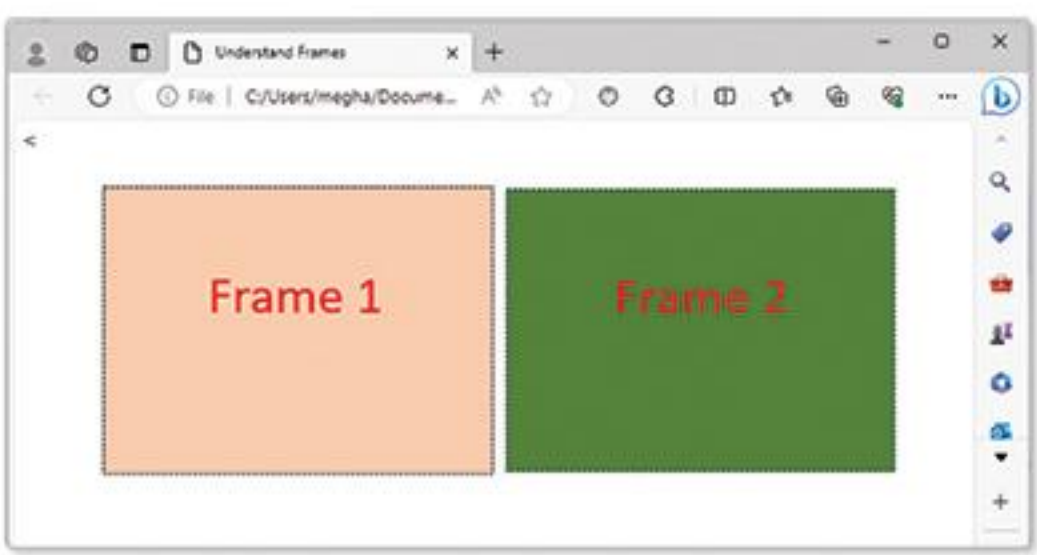
HTML codes for iframe:

```
<!DOCTYPE html>
<html>
<head>
    <title>IFrame Example</title>
</head>
<body>
<h1>Embedded Web Page</h1>
    <p>Below is an example of an iframe:</p>
    <iframe src="https://www.example.com" width="800" height="600" frameborder="0" scrolling="no"></iframe>
    <p>End of the embedded content.</p>
</body>
</html>
```

Go & Resolve

Scan the QR code & resolve.

How do you create iframe?



FORMS IN HTML5

In general, forms are used to gather the information from users, such as their names, email addresses, contact numbers, and comments.

With the help of forms, we can collect required data from the users. These forms are created

using <form> element of HTML. The <frame> element facilities to input text, email, password, number, values, and control fields such as checkboxes, radio buttons, submit buttons, etc.

Syntax:

```
<form>
    <!--form elements-->
</form>
```

Practical Tip

If you would like to receive the e-mail without an attachment in a text form, then in the <FORM> tag, type ENCTYPE = "TEXT/PLAIN".

Time To Think

Do you know how many websites have been developed using HTML? If not, please find the correct answer."

FORM ELEMENTS

Let's understand the elements of the form, they will use to create a form.

The <label> element: It is used to define a label for many form elements.

The <input> element: It is used to get input data from the form in various types such as text, password, email, etc. by changing its type. It is totally depending on the type of attribute.

- <input type="text"> → It displays a single-line text input field.
- <input type="radio"> → It displays a radio button.
- <input type="checkbox"> → It displays a checkbox (for selecting zero or more of many choices).
- <input type="submit"> → It displays a submit button.
- <input type="button"> → It displays a clickable button.

The <select> element: It is used to create a drop-down list.

The <textarea> element: It is used to get input long text content.

The <fieldset> element: It creates a box around other form elements and group the related data.

The <legend> element: It is used to define a caption for fieldset elements.

The <datalist> element: It is used to specify pre-defined list options for various input controls.

The <output> element: It is used to display the output of performed calculations.

The <option> element: It defines different options in a drop-down list.

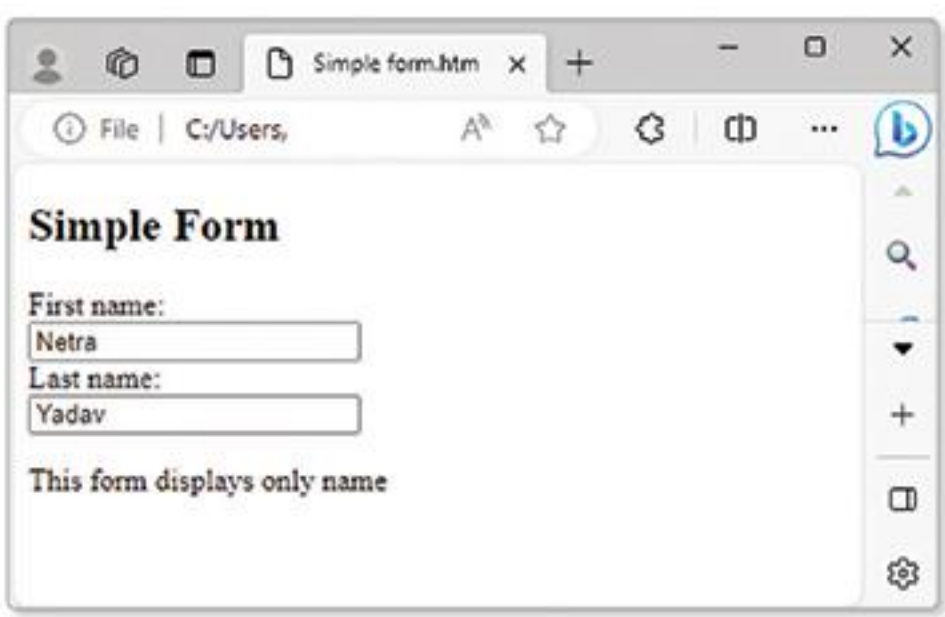
The <optgroup> element: It defines group-related options in a drop-down list.

CREATE A SIMPLE FORM

You know about the elements and their uses. Now create a simple form in HTML.

```
<!DOCTYPE html>
<html>
<body>

<h2>Simple Form</h2>

<form>
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="Netra"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Yadav">
</form>

<p>This form displays only name</p>

</body>
</html>
```

Ln 17, Col 8 | 100% | Windows (CRLF) | UTF-8



CREATE RADIO BUTTONS

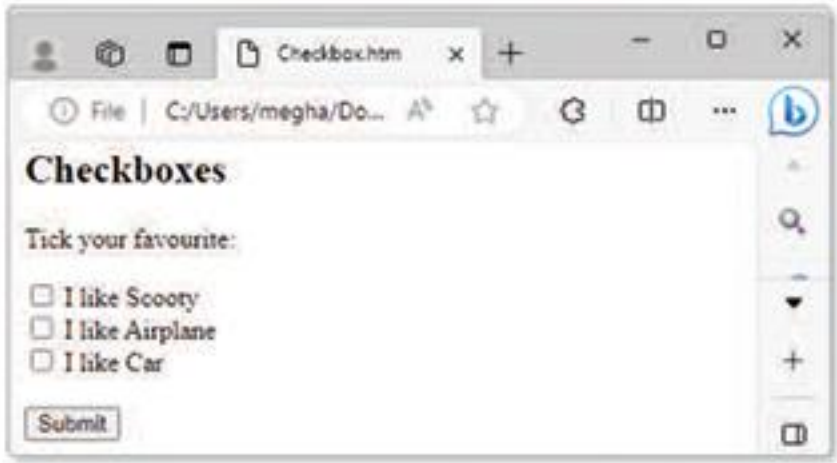
The <input type="radio"> defines a radio button. The radio buttons are normally presented in radio groups. Only one radio button in a group can be selected at the same time.

```
<!DOCTYPE html>
<html>
<body>

<h2>Games</h2>

<p> choose your favourite game </p>

<form>
  <input type="radio" id="html" name="fav_" value="Cricket">
  <label for="html">Cricket</label><br>
  <input type="radio" id="Badminton" name="fav_game" value="">
  <label for="css">Badminton</label><br>
  <input type="radio" id="Tennis" name="fav_game" value="JavaScript">
  <label for="Tennis">JavaScript</label>
</form>

</body>
</html>
```

CREATE CHECKBOXES

The <input type="checkbox"> defines a checkbox. A checkbox is used to select more than one option from a limited number of options.

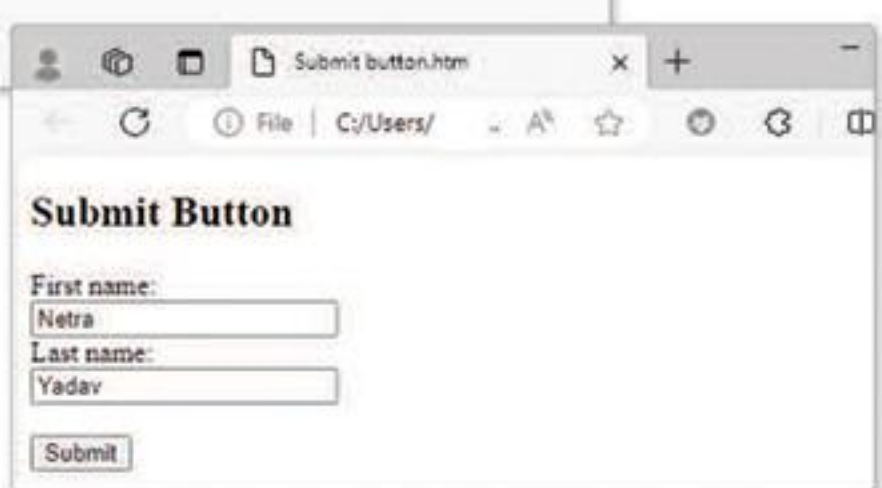
```
<!DOCTYPE html>
<html>
<body>

<h2>Checkboxes</h2>
<p>Tick your favourite:</p>

<form action="/action_page.php">
  <input type="checkbox" id="vehicle1" name="vehicle1" value="Scooty">
  <label for="vehicle1"> I like Scooty</label><br>
  <input type="checkbox" id="vehicle2" name="vehicle2" value="Airplane">
  <label for="vehicle2"> I like Airplane</label><br>
  <input type="checkbox" id="vehicle3" name="vehicle3" value="Car">
  <label for="vehicle3"> I like Car</label><br><br>
  <input type="submit" value="Submit">
</form>

</body>
</html>
```



SUBMIT BUTTON

The <input type="submit"> defines a submit button. The submit button is required to submits all form values to a form-handler. The form-handler is typically a server page with a script for processing the input data.

```
<!DOCTYPE html>
<html>
<body>

<h2>Submit Button</h2>

<form action="/action_page.php">
  <label for="fname">First name:</label><br>
  <input type="text" id="fname" name="fname" value="Netra"><br>
  <label for="lname">Last name:</label><br>
  <input type="text" id="lname" name="lname" value="Yadav"><br><br>
  <input type="submit" value="Submit">
</form>

<p>If you click the "Submit" button, the details will be sent to the official
website.</p>

</body>
</html>
```



Spot Check

Write answer in one line.

1. The <text area>: _____
2. The <option>: _____
3. The <src>: _____

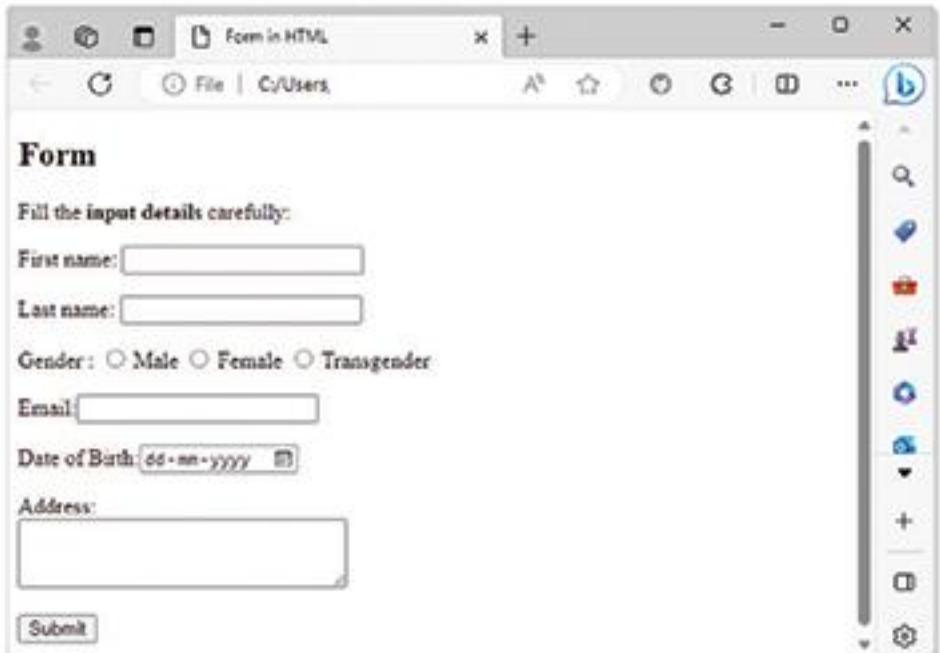
CREATE A FORM USING THE ELEMENT OF FORM

```
<!DOCTYPE html>
<head>
    <title>Form in HTML</title>
</head>
<body>
Form</h2>
<p>Fill the <strong> input details </strong> carefully:</p>
    <form>
            <label>First name: <input name="firstName" /></label>
        </p>

        <p>
            <label>Last name: <input name="lastName" /></label>
        </p>

        <p>
            Gender :
            <label><input type="radio" name="gender" value="male" />
                Male
              </label>
            <label><input type="radio" name="gender" value="female" />
                Female
```

Fact Zone

HTML has changed a ton since its beginnings in the 90s. The latest version, HTML5, was released in 2014.

```
            </label>
        <label><input type="radio" name="gender"
                    value="Transgender" />
            Transgender
            </label>
        </p>
        <p> <label>Email:<input type="email" name="email" />
            </label>
        </p>

        <p>
            <label>Date of Birth:<input type="date" name="birthDate">
            </label>
        </p>

        <p>
            <label>
                Address:
                <br />
                <textarea name="address" cols="30"
                        rows="3">
                </textarea>
            </label>
        </p>

        <p>
            <button type="submit">Submit</button>
        </p>
    </form>
</body>
</html>
```



In Summary

- Frames are used to divide your browser window into more than one section and each section can load a different HTML document.
- The frameset tag is used to define how to divide the browser window into the different frames.
- The cols attribute is used to define the number of columns and their sizes inside the <frameset> tag.
- The rows attribute is used to define the number of rows and their sizes inside the <frameset> tag.
- The border attribute is used to define the width of border of each frame.
- The src attribute is used to define the source file that should be loaded into the frame.
- The "iframe" tag creates a little box on a webpage where you can show another webpage inside it.
- The <frame> element facilities to input text, email, password, number, values, and control fields such as checkboxes, radio buttons, submit buttons, etc.

EXERCISES

A. Think and Tick (✓) the correct options.

1. What is the primary purpose of using frames?
   a. To divide the browser window into multiple sections. ☐
   b. To create interactive animations within a web page. ☐
   c. To apply different fonts and colors to HTML content. ☐
2. Which HTML tag is used to define how to divide the browser window into different frames?
   a. <frame> ☐ b. <iframe> ☐ c. <frameset> ☐
3. What does the "cols" attribute do in the <frameset> tag?
   a. It defines the number of rows and their sizes. ☐
   b. It defines the width of the frame border. ☐
   c. It defines the number of columns and their sizes. ☐
4. Which attribute is used to set the width of the frame border in HTML frames?
   a. cols ☐ b. rows ☐ c. border ☐
5. What is the primary purpose of the <frame> element in HTML?
   a. To create a container for displaying external web content. ☐
   b. To input various types of form data, such as text, email, and passwords. ☐
   c. To insert multimedia elements like images and videos. ☐

B. Fill in the blanks.

Hints border, iframe, legend, textarea, label, source file

1. The src attribute is used to define the _____ that should be loaded into the frame.
2. The _____ attribute is used to define the width of border of each frame.
3. The _____ tag creates a little box on a webpage where you can show another webpage inside it.
4. The _____ element is used to define a caption for field set elements.
5. The _____ element is used to get long text content as input.
6. The _____ element is used to define a label for many form elements.

C. Answer the following questions.

1. Write any two advantages of frame.

2. What is the use of framespacing attribute?

3. Define any two attributes of input element under the form.

4. Differentiate between marginwidth and marginheight attributes.

5. What is the use of row attribute?

6. Define iframe with its syntax.

7. What is frame? Write HTML codes to create a frame.

8. What is form? Write HTML codes to create radio buttons in a form.

COMPETENCY BASED QUESTION...

Critical Thinking, Digital Literacy

Ronak is working on a website. He wants to display multiple sections on a single webpage in the browser while also being able to open other interlinked webpages. He doesn't know how to achieve this. Help him by explaining the relevant HTML tag and its attributes.

Brain Test

Critical Thinking, Computational Thinking

Look at the given webpage and write HTML codes to create it.

Name:

Class:

School Name

Codes:

Brain Storming

Social interaction, Communication

Organise a group discussion on Forms and its relevance in HTML.

Activity

Creativity, Collaboration

Take a chart paper and create a registration form for new admissions to your school.

Life Skills

Digital Literacy

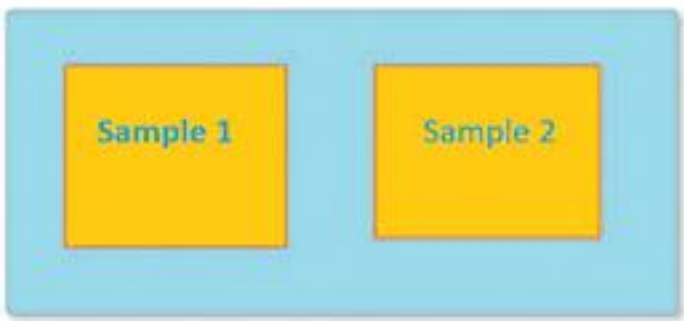
Always run your HTML codes on the authentic web browsers.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

Create a similar web page as given below.



Create a form as given below.

Save all the codes and exit the editor and browser.

Teacher's Note

1. Explain the significance of frame for webpages and websites.
2. Explain the difference between rows and cols attributes.
3. Explain forms in detail with attributes and elements.

7

Conditions in Python

Information Literacy, Collaboration, Critical Thinking

Warm Up

Write a Python program to perform addition on two numbers.

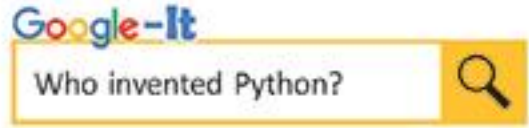
Write a Python program to perform subtraction on two numbers.

Learn About

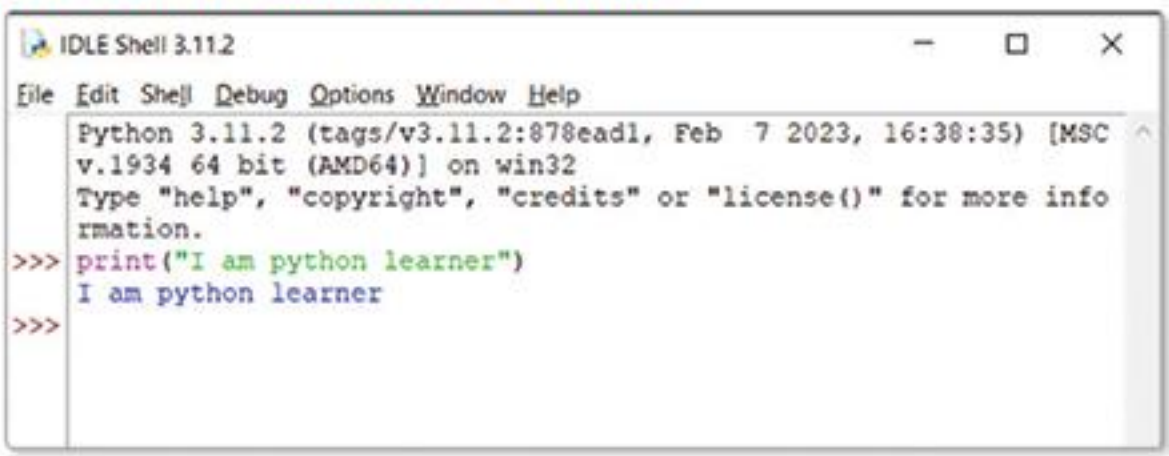
- Basics of Python
- Conditional statements
- The if Statement
- The if-else Statement
- The if-elif-else Statement
- Nested if Statements
- Practice with Python

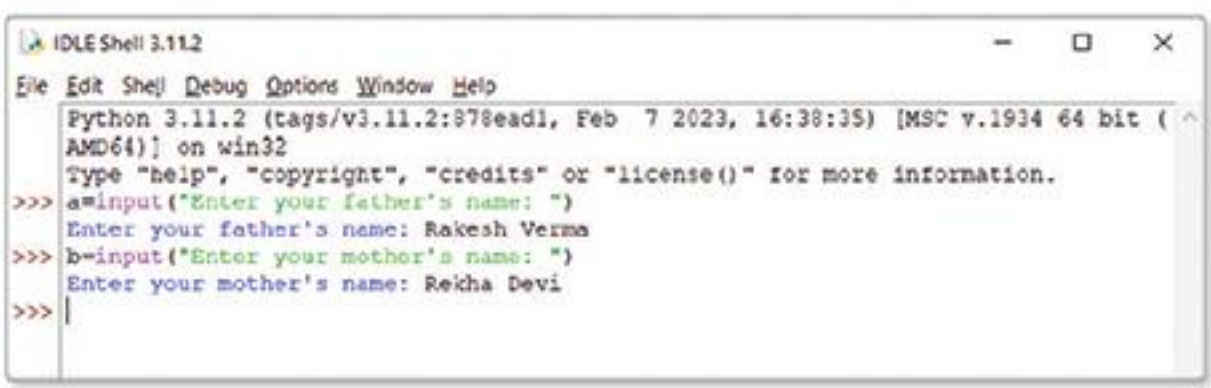
OPERATORS

In Python, operators are special symbols or characters. They perform particular operations on one or more operands and produce a result. Arithmetic, logical, and relational are some common types of operators.



WRITE A SIMPLE PROGRAM IN PYTHON


IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> print("I am python learner")
I am python learner
>>>


IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> a=input("Enter your father's name: ")
Enter your father's name: Rakesh Verma
>>> b=input("Enter your mother's name: ")
Enter your mother's name: Rekha Devi
>>>

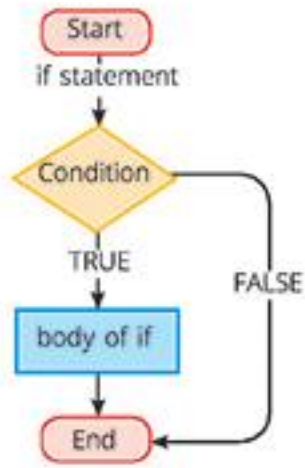
Now learn about the conditional statements in Python in detail.

CONDITIONAL STATEMENTS

In Python, conditional statements are essential constructs that allow you to control the flow of your program based on some conditions. In other words, these are the fundamental part of program that allows you to control the flow of our programs based on certain conditions. Python provides several types of conditional statements, such as if, if-else, and if-elif-else. In this chapter, you will learn about these statements and understand how to use them effectively.

THE IF STATEMENT

The if statement is a basic conditional statement that allows you to execute a block of code only if a specified condition is true. The general syntax of the if statement is:




```
if condition:
    statements(s)
```

```
*untitled*
File  Edit  Format  Run  Options  Window  Help
age=18
if age>=18:
    print("You are an adult")
```

Output:

```
IDLE Shell 3.11.2
File  Edit  Shell  Debug  Options  Window  Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v
.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more inform
ation.
>>>
========== RESTART: C:/User/Documents/Python Programs/if.
py ==========
You are an adult
>>>
```

In the above example, the code inside the if block will only be executed if the condition age >= 18 is true.

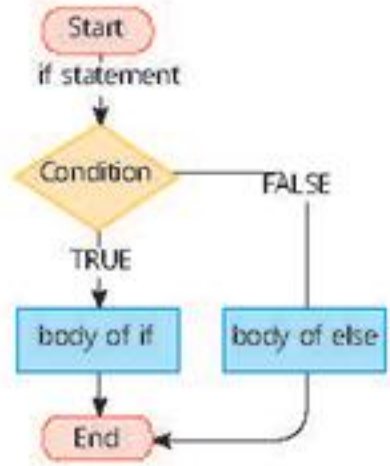
Time To Think

What problems did programmers face in code writing before the conditions?

THE IF-ELSE STATEMENT

The if-else statement allows us to execute one block of code, if a condition is true and another block of code, if the condition is false. The general syntax is:

```
if condition:
    statements(s)
else:
    statements(s)
```



untitled

File Edit Format Run Options Window Help

```
age = 16
if age >= 18:
    print("You are an adult.")
else:
    print("You are not an adult.")
```

Output:

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:3
5) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for mo
re information.
>>>
========== RESTART: C:/Users/Documents/Python Progr
ams/ifelse.py ==========
You are not an adult.
>>>
```

Ln: 6 Col: 0

In this example, if the condition age >= 18 is true, the first block of code is executed. Otherwise, the second block of code (in the else clause) is executed.

Spot Check

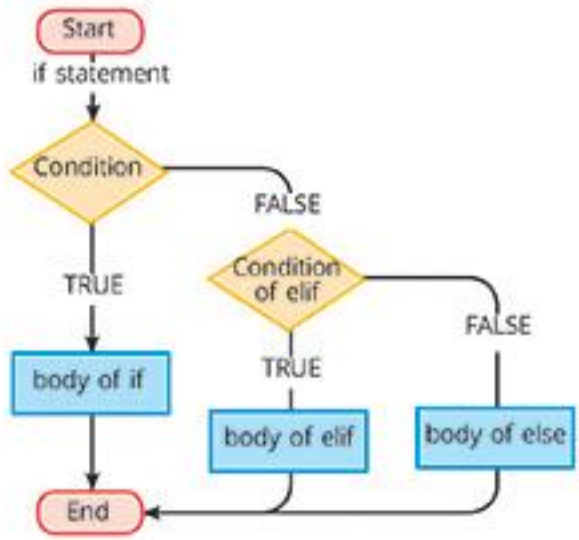
Write T for true and F for false.

1. The input() function is used to show the output. _____
2. The if statement is not a conditional statement. _____
3. Python is an object-oriented and interpreted language. _____

THE IF-ELIF-ELSE STATEMENT

The if-elif-else statement allows us to handle multiple conditions sequentially. It checks each condition in order and executes the corresponding block of code for the first true condition. The general syntax is:

```
if condition1:
    statements(s)        # body of if
elif condition2:
    statements(s)        # body of elif
elif condition3:
    statements(s)        # body of elif
else:
    statements(s)        # body of else
```



Example,

*ifelifelse.py - C:/Users/Documents/Python Pro...

File Edit Format Run Options Window Help

```
score = 80
if score >= 90:
    print("Grade: A")
elif score >= 80:
    print("Grade: B")
elif score >= 70:
    print("Grade: C")
else:
    print("Grade: D")
```

Fact Zone

Python is an open-source language; it does not have a proprietary license that restricts who can use it.

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

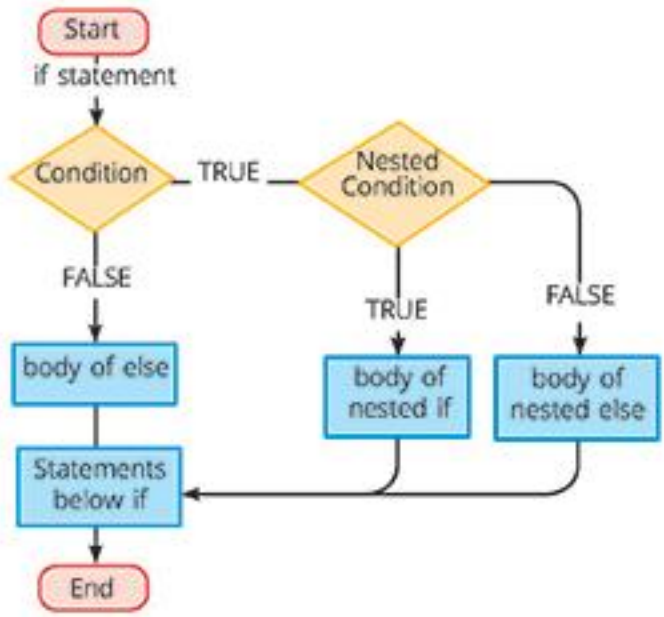
```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38
:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for
more information.
>>>
======== RESTART: C:/Users/Documents/Python Progr
ams/ifelifelse.py =======
Grade: B
>>>
```

In this example, the program will print the corresponding grade based on the value of the score.

NESTED IF STATEMENTS

Nested if statements occur when an if statement is placed inside another if or else block. This allows for more complex conditions and logic. The general syntax is:

```
if condition1:
    # code to be executed if condition1 is true
    if condition2:
        # code to be executed if both condition1 and condition2 are true
    else:
        # code to be executed if condition1 is true but condition2 is false
else:
    # code to be executed if condition1 is false
```



Example:

nestedif.py - C:/Users/tusha/Documents/Python Programs/nestedif.py (3.11.2)
File Edit Format Run Options Window Help
age = 10
has_license = True
if age >= 18:
print("You are eligible for a driver's license.")
if has_license:
print("You already have a driver's license.")
else:
print("You don't have a driver's license.")
else:
print("You are too young to apply for a driver's license.")

IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MS
C v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more inf
ormation.
>>>
========== RESTART: C:/Documents/Python Programs/nes
tedif.py ==========
You are too young to apply for a driver's license.
>>>

In this example, we first check if the age is above 18. If it is, we check whether the person has a driver's license or not.

If we will change the value, then output will also change accordingly.

nestedif.py - C:/Users/Documents/Python Programs/nestedif.py (3.11.2)

File Edit Format Run Options Window Help

```
age = 30
has_license = True
if age >= 18:
    print("You are eligible for a driver's license.")
    if has_license:
        print("You already have a driver's license.")
    else:
        print("You don't have a driver's license.")
else:
    print("You are too young to apply for a driver's license.")
```

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
ormation.
>>>
========= RESTART: C:/Use/Documents/Python Programs/nes
tedif.py ========
You are too young to apply for a driver's license.
>>>
= RESTART: C:/Users/Documents/Python Programs/nestedif.py
You are eligible for a driver's license.
You already have a driver's license.
>>>
```

Experiential Learning

Visit a coffee shop and analyse the cost of a cup of coffee, which depends on its size and any additional toppings. Now, develop a Python code to calculate the total cost of the coffee order based on the collected information.

Go & Resolve

Scan the QR code & resolve.

How can you calculate the sum of n natural numbers using Python?

PRACTICE WITH PYTHON

Program 1: Using If statement

*If sample.py - C:/Users/Documents/Python Programs/If ...

File Edit Format Run Options Window Help

```
# if statement
if 10 > 5:
    print("10 greater than 5")

print("Program ended")
```

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.1
934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more informat
ion.
>>>
======== RESTART: C:/Users/Documents/Python Programs/If sample
.py ========
10 greater than 5
Program ended
>>>
```

Program 2: Using if-else statement

untitled

File Edit Format Run Options Window

```
x = 6
if x == 5:
    print("Yes")
else:
    print("No")
```

Fact Zone

In Python, everything is done by reference. It doesn't support pointers.

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [
MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more i
nformation.
>>>
======= RESTART: C:/Users/Documents/Python Programs/ife
lsesample.py =======
No
>>>
```

Program 3: Using if-elif-else statement

untitled

File Edit Format Run Options Window Help

```
letter = "X"

if letter == "Y":
    print("letter is Y")

elif letter == "Z":
    print("letter is Z")

elif letter == "X":
    print("letter is X")
```

Fact Zone

Python provides extensions for the C and Java programming languages.

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35)
[MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more
information.
>>>
======== RESTART: C:/Users/Documents/Python Programs/p
ractice3.py ========
letter is X
>>>
```

Program 4: Using nested if statement

untitled

File Edit Format Run Options Window Help

```
num = 20

if num > 5:
   print("Bigger than 5")

   if num <= 15:
      print("Between 5 and 15")
```

Fact Zone

Python is one of the few programming languages recognized by Google as an official language.

IDLE Shell 3.11.2

File Edit Shell Debug Options Window Help

```
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [MSC v.
1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more informa
tion.
>>>
======== RESTART: C:/Users/Documents/Python Programs/Practice
4.py ========
Bigger than 5
>>>
```

In Summary

- Python is an object-oriented, interpreted, high-level programming language.
- The print() function is used to show the output which.
- The input() function is used to take input(value) for a variable from the user
- Data type is a value or set of values that a variable can hold.
- keywords are the reserved words that have predefined meaning.
- Punctuators are used to separate the different parts of the program as per the need.
- Operators are special symbols or characters.
- The if statement allows you to execute a block of code only if a specified condition is true.
- The if-else statement allows us to execute one block of code if a condition is true and another block of code if the condition is false.
- The if-elif-else statement allows us to handle multiple conditions sequentially.
- Nested if statements means an if statement is placed inside another if or else block.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which of the following is used to take input(value) for a variable from the user?

   a. input() function ☐ b. output() function ☐ c. print() function ☐

2. The _____is a value or set of value that a variable can hold.

   a. Variable ☐ b. Operator ☐ c. Data type ☐

3. Which of the following is used to separate the different parts of the program?

   a. Punctuator ☐ b. Separator ☐ c. Variable ☐

4. Which of the following is used to perform particular operations on one or more operands?

   a. Variable ☐ b. Operator ☐ c. Punctuator ☐

5. Which of the following allows you to execute a block of code only if a specified condition is true?

   a. if statement ☐ b. if-else statement ☐ c. if-elif statement ☐

6. Which of the following allows you to handle multiple conditions sequentially?

   a. if-elif-else statement ☐ b. if-else statement ☐ c. if-elif statement ☐

B. Fill in the blanks.

Hints output, libraries, python, conditional, Nested if, keywords

1. Python has large _____ and supporting tools to make task easy.
2. The _____ are the reserved words that have predefined meaning.
3. The print() function is used to show the _____ which is enter by the user.
4. The _____ statements allow you to control the flow of your program based on some conditions.
5. The _____ is easy to learn and understand.
6. The _____ statements occur when an if statement is placed inside another if or else block.

C. Answer the following questions.

1. What are data types?

   _____

   _____

2. What is the use of punctuators?

   _____

   _____

3. Write any two features of Python.

   _____

   _____

4. Define if statement with syntax.

   _____

   _____

   _____

5. Explain the working of if-elif-else statement with an example.

6. Explain working of nested if statement with syntax.

7. Write a program to find 2017 year is leap year or not.

COMPETENCY BASED QUESTION...

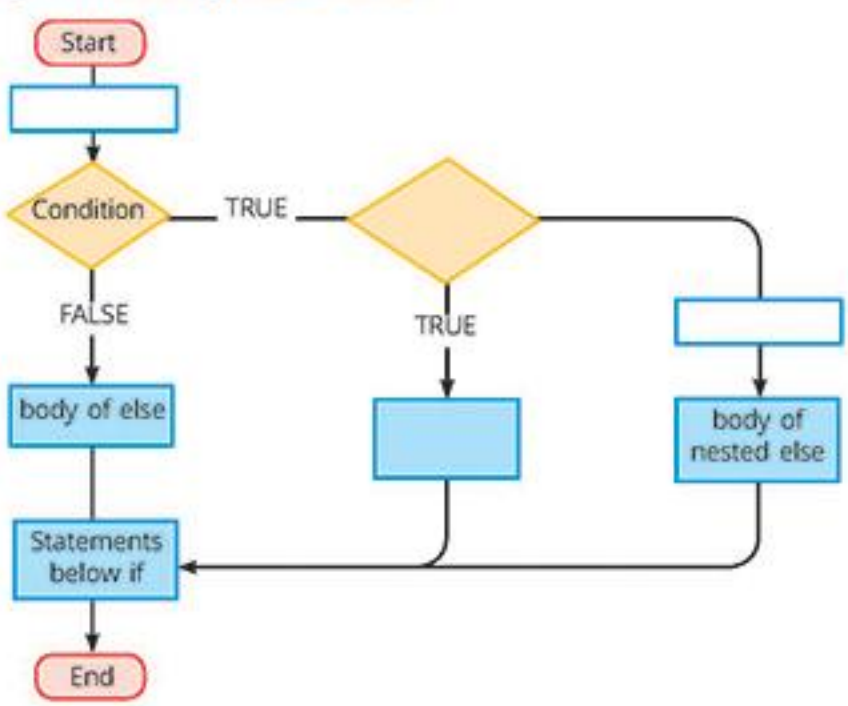
Critical Thinking, Digital Literacy

Diya is writing a program to display grades for students based on their exam marks. The grades range from A to F. Suggest a suitable conditional statement for her to achieve this.

Brain Test

Critical Thinking, Computational Thinking

A. Fill the missing values in the given flow chart.



B. Find the error in the given code.

```
age = 16
limit = 25
if (age = 16):
    print (Age is correct as mentioned)
if (age < 25)
    print('Below age')
if (age > 10):
    printTeen)
if (age <= limit):
    print(Under age limit
if (age >= limit)
    printAbove limit)
```

Errors:

Brain Storming

Social Interaction, Communication

Organise a group discussion on the conditional statements in Python.

Life Skills

Self development

Always save your code with appropriate name for future use.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Write Python program to find a number is even or odd.
2. Write Python program to check two numbers are equal or not.
3. Write Python program to check a number is positive or negative.

Teacher's Note

1. Explain the basics of Python like features, data types, operators and punctuators.
2. Explain the various conditional statements with examples in detail.

8 Loops in Python

Information Literacy, Collaboration, Critical Thinking

Warm Up

Write syntax of if-else statement.

Syntax:

Write output of the following code:

```
#printing a string
#print three fruits name
print("Apple")
print("Orange")
print("Banana")
```

Output:

Learn About

- Loops in Python
- The while loop
- The for loop
- continue Statement
- break Statement
- pass Statement
- Functions in python
- String
- Practice with Python

LOOPS IN PYTHON

A loop is a programming concept that allows you to repeat a specific set of instructions or actions multiple times until a certain condition is met.

Imagine you have a task, such as counting from a to m. Instead of writing the alphabet manually, you can use a loop to make the computer do it for you. The loop will start at a, count to m, and each time it counts, it performs a predefined action (in this case, displaying the number). Once it reaches m, it stops.

THE WHILE LOOP

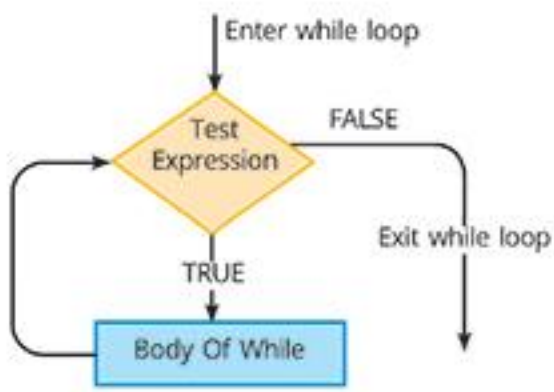
The while loop is used to execute a block of statements repeatedly until certain condition is met. Once the condition becomes false; it stops the loop and moves on to the next line of instructions in the program.

Syntax:

```
while expression:
    statement(s)
```

Example:

```
while.py - C:/Users/Documents/Python Progr...
File  Edit  Format  Run  Options  Window  Help
count = 0
while (count < 5):
    count = count + 1
    print("Hello Python")
```




```
IDLE Shell 3.11.2
File  Edit  Shell  Debug  Options  Window  Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb  7 2023, 16:38:35) [
MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more i
nformation.
>>>
========== RESTART: C:/Users/Documents/Python Programs/
while.py ==========
Hello Python
Hello Python
Hello Python
Hello Python
Hello Python
>>>
                                                    Ln: 10  Col: 0
```

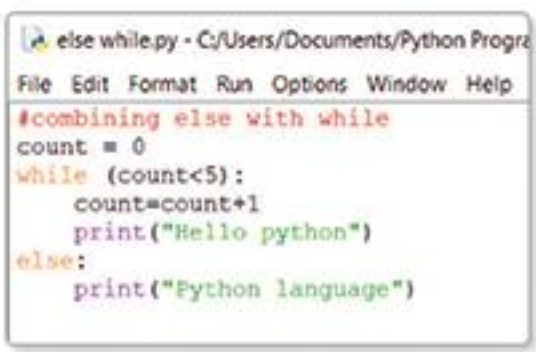
THE ELSE STATEMENT WITH WHILE LOOP

The "else" part of your code only runs when the condition you set in the "while" loop becomes false. It won't run if you exit the loop early or if there's an error (exception) that interrupts the loop.

Syntax:

```
while condition:
    # Execute these statements
else:
    # Execute these statements
```

Example:



IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
======== RESTART: C:/Users/Documents/Python Programs/else while.py ========
Hello python
Hello python
Hello python
Hello python
Hello python
Python language
>>>

THE FOR LOOP

When you know about how many times a body of a loop has to be executed, then you use a for loop. It is also called definite loop.

- **Initialization:** Setting an initial value or condition.
- **Condition:** Specifying when the loop should continue running.
- **Iteration:** Defining how the loop's variable changes after each iteration.

The loop continues to execute its code block as long as the specified condition remains true. It's commonly used for tasks such as iterating through elements in an array, performing a set number of iterations, or looping through a sequence of numbers.

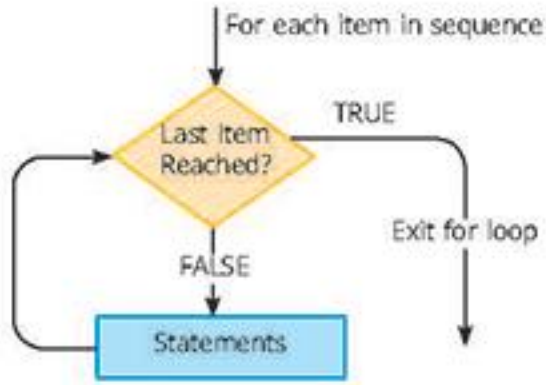
Syntax:

```
for<variable>in<sequence>:
```

Body of loop(statements)

Example:

```
*untitled*
File  Edit  Format  Run  Options  Window  Help
# Iterating over range 0 to n-1
n = 10
for i in range(0, 20):
    print(i)
```

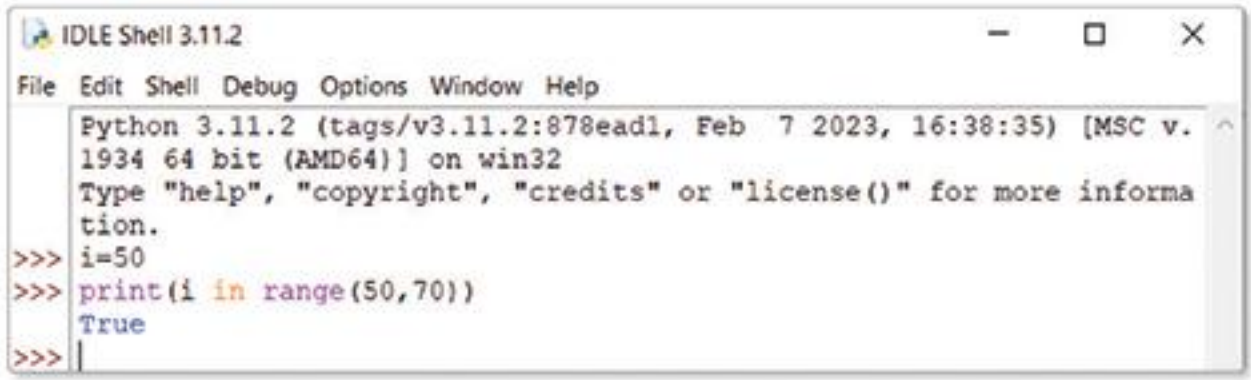



```
IDLE Shell 3.11.2
File  Edit  Shell  Debug  Options  Window  Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb
7 2023, 16:38:35) [MSC v.1934 64 bit (AMD
64)] on win32
Type "help", "copyright", "credits" or "l
icense()" for more information.
>>>
========== RESTART: C:/tusha/Docum
ents/Python Programs/for.py ==========
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
>>>
```

THE RANGE() FUNCTION

In python, the range function is used to generate a sequence of numbers in the form of a list. So that it will be helpful in the for loop.

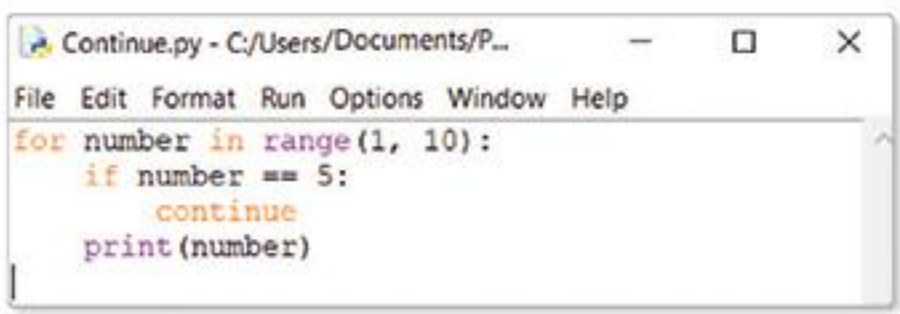
For example, we want to return a true value using range() function.


IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MSC v.
1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more informa
tion.
>>> i=50
>>> print(i in range(50,70))
True
>>>

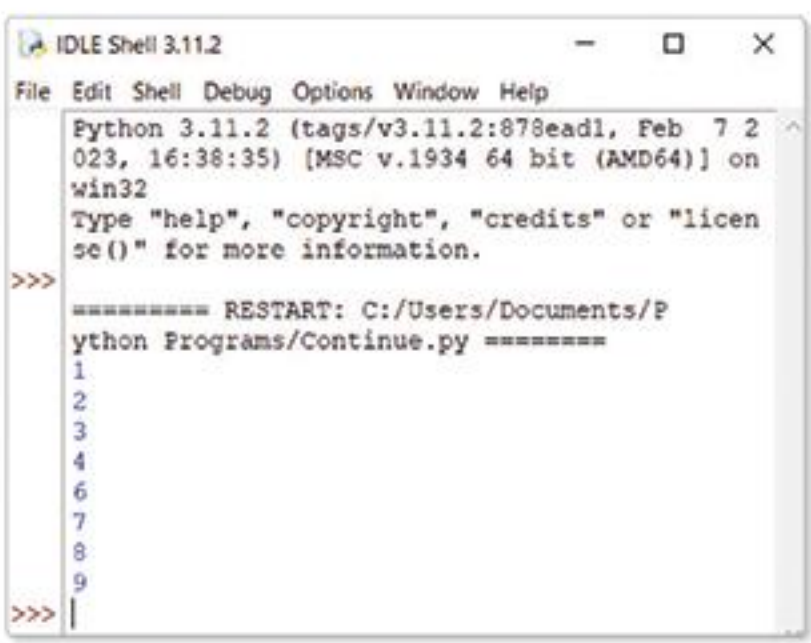
CONTINUE STATEMENT

The "continue statement" allows you to skip the current iteration and move on to the next one without completing the remaining code for the current iteration.

Example:



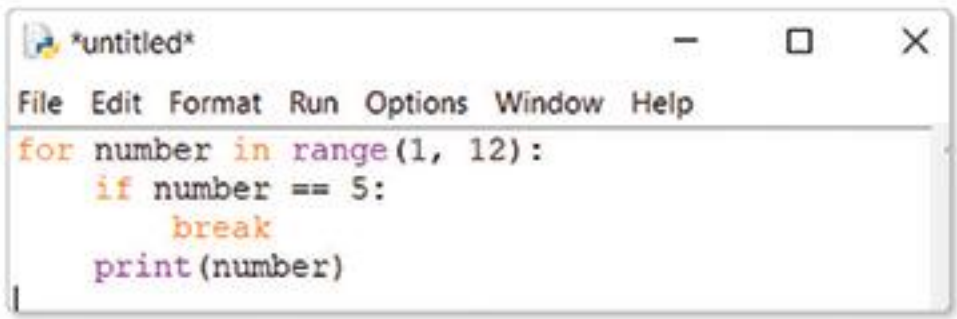
Output:



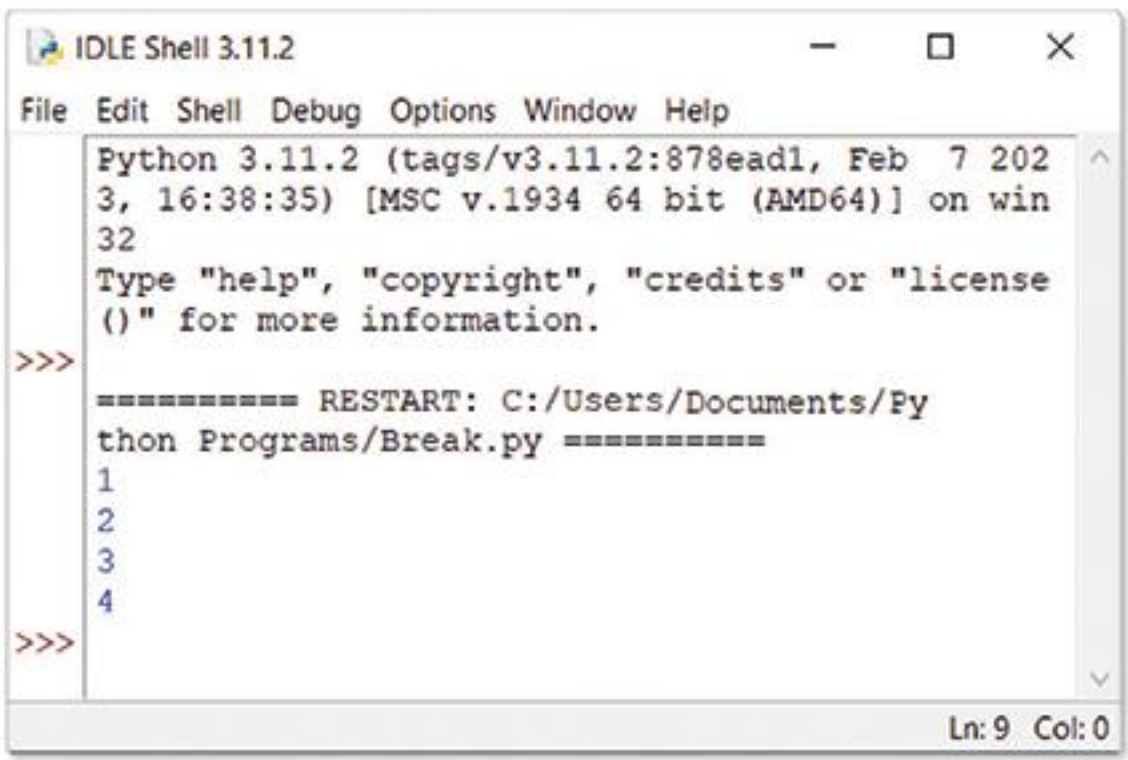
BREAK STATEMENT

The break statement is used to exit the loop prematurely, even if the loop's original condition is still true. It is often used to terminate a loop when a particular condition is satisfied.

Example:



Output:



PASS STATEMENT

In Python, pass statement is used to write empty loops. It is also used for empty control statements, functions, and classes.

CREATING A FUNCTION

In Python, you can create a function using def keyword. Any input data that the function needs (known as parameters or arguments) is specified within the parentheses. The function's code block is indented below the function definition.

Syntax:

```
def < name of the function > (list of arguments)
    <body>
```

CALLING A FUNCTION

To call a function, you simply write its name followed by parentheses. You can provide the necessary arguments inside the parentheses, if required.

```
Warm("John")
```

Example:

```
def add_numbers(num1, num2):
    return num1 + num2
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))
result = add_numbers(num1, num2)
print("The sum of", num1, "and", num2, "is", result)
```

Practical Tip

While typing the code, remember the letter case, otherwise it will display an error.

Spot Check

Write syntax of the while loop.

_____

_____

_____

STRING

A string is sequence of characters which is enclosed within single (' ') or double (" ") quotes. It can be a sequence of letters, numbers, special characters etc.

For example,

```
name = input ('Enter your name:')
print ('Hello' + name)
```

Practical Tip

When you are writing Python programs, use correct indentation; otherwise, you will get errors when running your code.

CREATING A STRING

```
>>> first_name = "DPS"
>>> last_name = "School"
>>> str = " "
```

ESCAPE SEQUENCE

Escape sequences serve the purpose of incorporating special characters within a string that would otherwise be considered invalid in Python. Quotes, being one such special character, require the use of an escape sequence () preceding them when inserting them into a string. escape them with a \ character in front of them.

For Example:

```
>>>str = "This is Rakesh's phone."
>>> print(str)
```

Output: This is Rakesh's phone.

Fact Zone

Google's website has been created using Python programming language.

Experiential Learning

Visit a hotel or restaurant and analyse menu. Write python codes to print dishes of the same menu. Now which loop and function you were used to do so?

_____

_____

MULTILINE STRINGS

Python use triple quotes to write multi-line strings.

For example:

```
>>>print ("""Python is a programming language. I want to learn python. You want to learn the same.""")
```

Output:

"Python is a programming language. I want to learn python. You want to learn the same.

STRING FUNCTIONS

Let's learn about the built-in function of Strings in Python.

The len() function: This function is used to calculate and return the length of a string supplied as an argument.

Example:

```
>>>str = "Python"
>>>print(len(str))
```

Output:

6

The lower() function: This function is used to convert all uppercase letters to lowercase.

Example:

```
>>>"PYTHON".lower()
```

Output:

python

The upper() function: This function is used to convert all lowercase letters to uppercase.

Example:

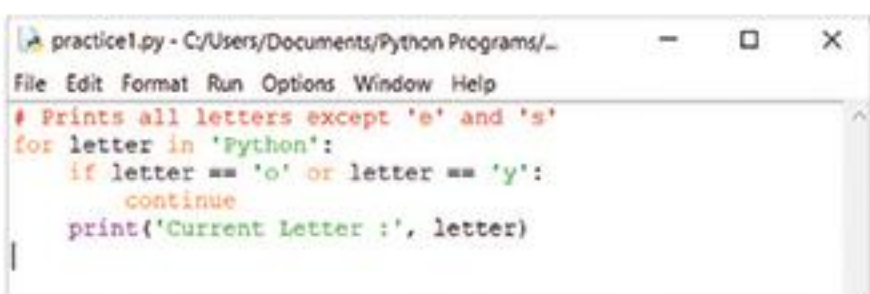
```
>>>"python".upper()
```

Output:

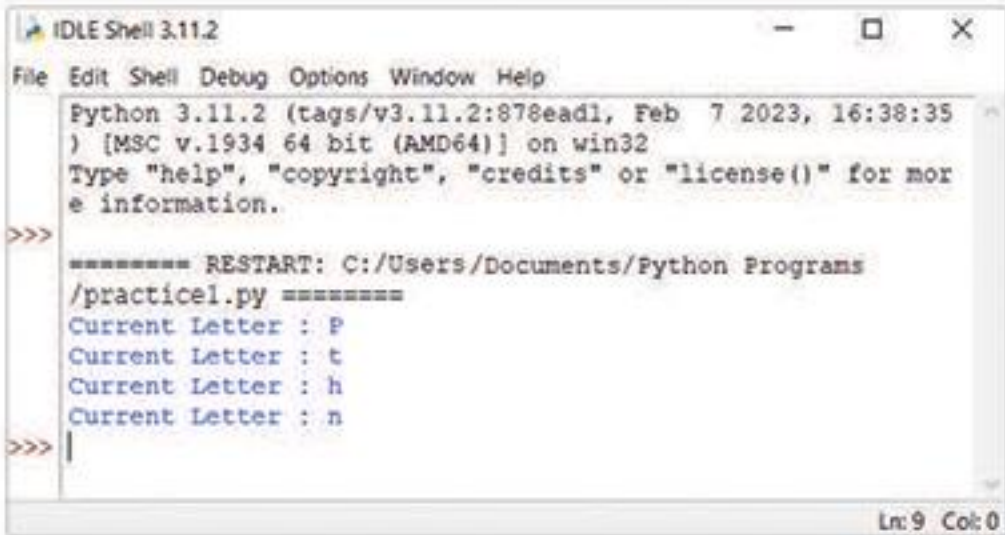
PYTHON

PRACTICE WITH PYTHON

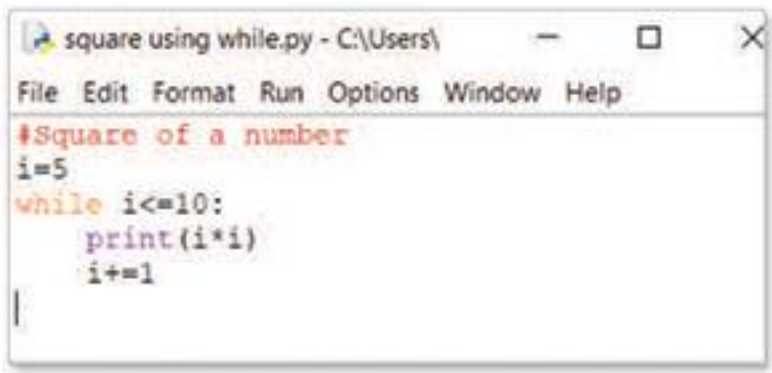
Program 1: Using Continue statement


practice1.py - C:/Users/Documents/Python Programs/...
File Edit Format Run Options Window Help
# Prints all letters except 'e' and 's'
for letter in 'Python':
if letter == 'o' or letter == 'y':
continue
print('Current Letter :', letter)

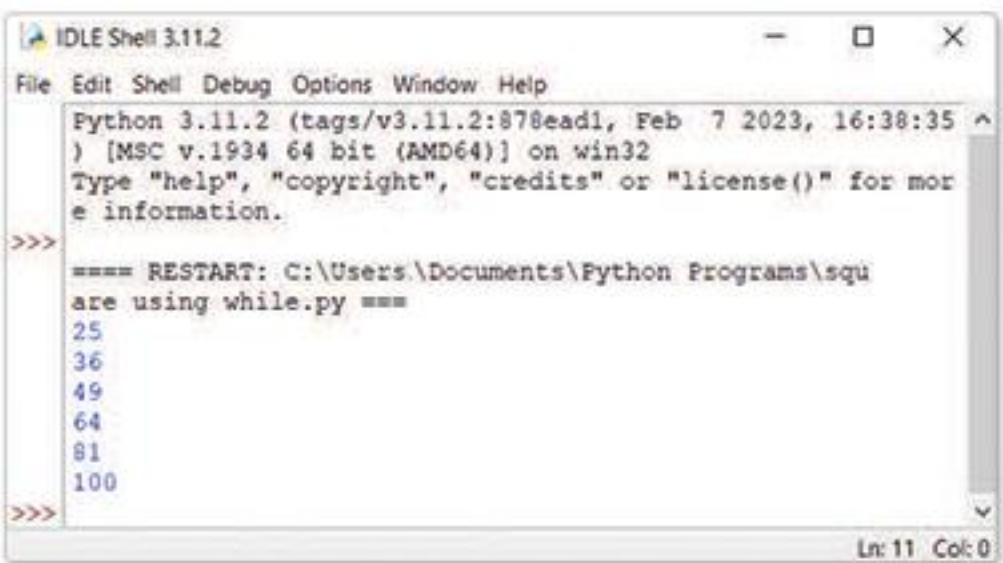
Output:


IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35
) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for mor
e information.
>>>
======== RESTART: C:/Users/Documents/Python Programs
/practice1.py ========
Current Letter : P
Current Letter : t
Current Letter : h
Current Letter : n
>>>
Ln: 9 Col: 0

Program 2: Using while loop

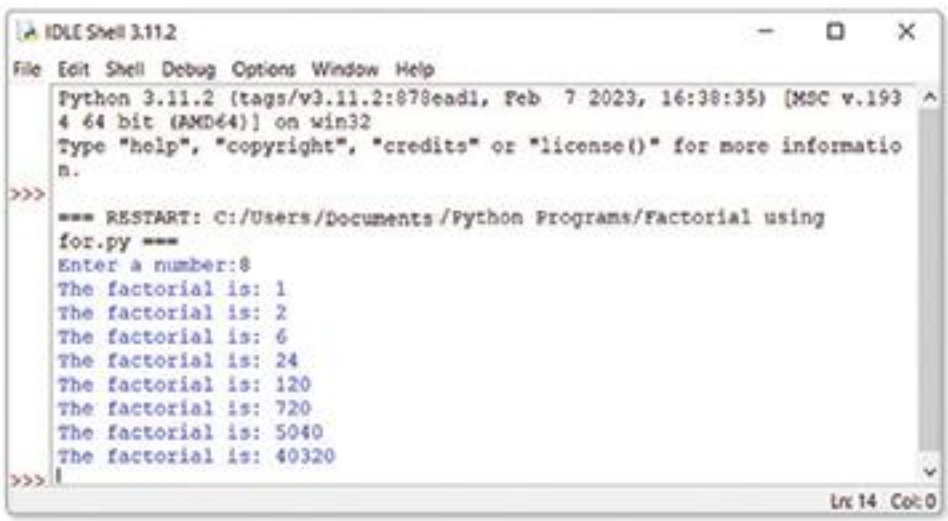


Output:



Program 3: Using for loop

Output:


IDLE Shell 3.11.2
File Edit Shell Debug Options Window Help
Python 3.11.2 (tags/v3.11.2:878ead1, Feb 7 2023, 16:38:35) [MSC v.1934 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
=== RESTART: C:/Users/Documents/Python Programs/Factorial using for.py ===
Enter a number:8
The factorial is: 1
The factorial is: 2
The factorial is: 6
The factorial is: 24
The factorial is: 120
The factorial is: 720
The factorial is: 5040
The factorial is: 40320
>>>
Ln: 14 Col: 0

In Summary

- A loop allows you to repeat a specific set of instructions or actions multiple times until a certain condition is met.
- The while loop is used to execute a block of statements repeatedly until certain condition is met.
- The "else" part of your code only runs when the condition you set in the "while" loop becomes false.
- The break statement is used to exit the loop prematurely, even if the loop's original condition is still true.
- Functions allow you to create reusable codes, which can be invoked whenever needed.
- A string is sequence of characters which is enclosed within single (' ') or double (" ") quotes.
- The len() function is used to calculate and return the length of a string supplied as an argument.
- Python uses triple quotes to write multi-line strings.

EXERCISES

A. Think and Tick (✓) the correct options.

1. In programming, what is the primary purpose of a loop?
   a. Organizing code ☐ b. Storing data ☐
   c. Repeating a set of instructions ☐ d. Handling errors ☐
2. Which of the following is used to execute a block of statements repeatedly until certain condition is met?
   a. While loop ☐ b. Do-while loop ☐
   c. if statement ☐ d. break statement. ☐
3. What is the main function of the "continue" statement within a loop?
   a. It terminates the loop immediately. ☐
   b. It forces the loop to start over from the beginning. ☐
   c. It skips the current iteration and proceeds to the next iteration. ☐
   d. It performs an action on the current iteration and continues. ☐
4. Which of the following is used to exit the loop prematurely, even if the loop's original condition is still true?
   a. While loop ☐ b. Do-while loop ☐
   c. If statement ☐ d. break statement. ☐
5. Which of the following statements is used to write empty loop?
   a. Continue ☐ b. pass ☐
   c. If ☐ d. Break ☐
6. Which of the following allows you to create reusable code?
   a. Loop ☐ b. Function ☐
   c. Statements ☐ d. All of these ☐
7. A string is enclosed within _____ quotes.
   a. Single (' ') ☐ b. Double (" ") ☐
   c. Triple ☐ d. All of these ☐

B. Fill in the blanks.

Hints false, break, pass, else, name, value

1. Functions can return _____ using the return statement.

2. In the while loop, once the condition becomes _____ , it stops the loop and moves on to the next line of instructions in the program.
3. The _____ is often used to terminate a loop when a particular condition is satisfied.
4. The _____ part of your code only runs when the condition you set in the "while" loop becomes false.
5. A function _____ should be unique and related to the task it will perform.
6. The _____ is used for empty control statements, functions, and classes.

C. Answer the following questions.

1. What is a loop?

_____

_____

2. What is the use of a pass statement?

_____

_____

3. What are the parts of a function?

_____

_____

4. What is string?

_____

_____

5. Define loop and write its syntax also.

_____

_____

6. Explain for loop with an example.

_____

_____

_____

7. Differentiate between break and continue statement.

_____

_____

_____

8. Explain function. How do you create a function?

COMPETENCY BASED QUESTION...

Imagine you are developing a mobile banking application. One of the features you need to implement is a balance checker that continuously updates the user's account balance until they decide to exit. Which loop will you use to do so?

Brain Test

Critical Thinking, Computational Thinking

A. Find eight words related to the Python in the given grid.

F	O	R	A	R	P	A	S	S	C	Z	G	R	C
E	D	U	E	T	F	I	G	T	L	A	Y	O	O
E	D	G	E	E	U	Z	X	R	O	V	B	B	N
I	R	M	Q	A	N	R	M	I	U	X	R	T	T
M	T	E	X	T	C	N	D	N	D	Q	E	I	I
C	I	N	R	U	T	U	C	G	Z	A	A	C	N
P	T	T	S	M	I	R	T	S	E	N	K	S	U
X	Y	E	I	Q	O	Z	X	C	V	B	I	O	E
P	Y	T	H	O	N	R	T	U	W	H	I	L	E

B. Find the errors in the given codes:

1.
```
text = input("Enter a string: "
char_count = lens(text)
printf("The number of characters in the string is:", char_count)
```

2. n = int(input("Enter a number: "))

```
sum == 0
i = 1
while i <= n
    sum += i
    i += 1i
print("The sum of the first", n, "natural numbers is:", sum)
```

Brain Storming

Social Interaction, Communication

Organise a group discussion on loops and their types.

Activity

Creativity, Collaboration

Draw flow charts of for and while loops on a chart paper. Also write their work and show it to your teacher.

In the Lab

Digital Literacy

Go to your computer lab and do the following:

1. Write Python programs to:
   a. print numbers from 1 to 10 using while loop.
   b. calculate the Sum of First ten natural Numbers.
   c. display Multiplication Table of 13.

d. creates a simple guessing game where the user needs to guess a randomly chosen number between 1 and 20.

e. find the Square of a Number using a Function.

f. find the Square of a Number using a Function.

g. take a string input from the user and calculate and display the number of characters in the string.

2. Save each program with a specific or unique name.
3. Run each program carefully.
4. Exit the IDLE.

Teacher's Note

1. Explain the use of loops—while and for in detail.
2. Demonstrate about using functions in Python.
3. Discuss how to use the functions of a string.

9

Future of AI

Information Literacy, Collaboration, Critical Thinking

Warm Up

In the previous class you have learnt about various AI devices and their uses. Now identify the given AI devices and their names and uses.

_____

_____

_____

_____

Learn About

- Smart Homes
- Smart Highways
- Smart Hospitals
- Smart Education
- Smart Cities
- AI Ethics
- AI Game- Even Stranger Things

SMART HOMES

The concept of a smart home has evolved significantly over the years. Smart homes aim to improve daily life and make it easy by automating tasks, enhancing security, promoting energy efficiency, and providing convenience and comfort for the people. In future, smart homes will be intelligent, adaptive, energy-efficient, and designed to enhance our daily lives in different ways.

Smart Thermostats: These devices optimize heating and cooling as per need and schedules, contributing to energy savings.

Smart Lighting Systems: They can be controlled remotely, set on timers, or adjusted for brightness and colour temperature.

Smart Locks and Security Systems: Smart locks and security systems that can be controlled and monitored remotely, improving home security.

Voice Assistants and Voice Control: The voice-controlled assistants like Amazon Alexa, Google Assistant, and Apple Siri are used to control smart devices, answer questions, and provide information.

Connected Appliances: Home appliances that can be controlled and monitored remotely for increased efficiency and convenience.

Smart Sensors and Detectors: These devices detect motion, smoke, carbon monoxide, or leaks and send alerts to homeowners.

Fact Zone

Robot Journalism is going to replace the traditional journalism.

Smart TVs and Audio Systems: Televisions and audio equipment can be connected to the internet, allowing streaming and integration with other smart devices.

Smart Cameras and Video Doorbells: Surveillance cameras and video doorbells are used with remote monitoring and real-time alerts for enhanced home security.

Mesh Wi-Fi Systems: Networking solutions that ensure strong and consistent internet connectivity throughout the home, as is it crucial for smart devices to function optimally.

SMART HIGHWAYS

A smart highway integrates advanced technologies like sensors, cameras, and communication systems to optimize traffic flow, enhance safety, and reduce congestion. It enables real-time monitoring of road conditions, traffic patterns, and accidents, facilitating immediate response and rerouting. Smart highways may incorporate features like adaptive traffic signals, dynamic lane management, and automated tolling for efficient transportation. They use data analytics to predict traffic trends and improve overall road network management. Integration of renewable energy sources and electric vehicle charging stations is also a key aspect, promoting sustainable transportation. Smart highways aim to enhance driver experience, reduce travel times, and contribute to a more environmentally friendly and connected transportation infrastructure.

Traffic Monitoring and Surveillance: It includes cameras, sensors, and other monitoring devices that collect real-time traffic data, enabling traffic flow analysis and incident detection.

Traffic Signal Control Systems: They include adaptive traffic signal systems that adjusts signal timing based on traffic conditions to optimize traffic flow and reduce congestion.

Variable Message Signs (VMS): They include digital signs that display real-time traffic information, speed limits, and warnings to drivers, helping manage traffic and improve safety.

Automated Toll Collection: It includes electronic toll collection systems that use RFID and other technologies to streamline toll payment processes and reduce traffic congestion.

Smart Street Lighting: It includes energy-efficient lighting systems that adjust brightness based on traffic conditions and time of day to save energy and reduce light pollution.

Dynamic Route Planning: It includes navigation systems that provide real-time traffic updates and suggest alternative routes to avoid congestion and delays.

Self-healing Materials: Road materials designed to self-repair cracks and damage, extending the lifespan of the road and reducing maintenance costs.

Time To Think

Before the highway and well maintained roads how the people will travel? Think and find the answer.

SMART HOSPITALS

Smart hospitals, also known as intelligent or digital hospitals, are healthcare institutions that leverage advanced technologies and data-driven approaches to improve the efficiency, quality, and overall patient experience within the healthcare system. These technologies are designed to streamline operations, enhance communication, optimize resource allocation, and facilitate better decision-making for healthcare professionals.

Electronic Health Records: Digital records that contain comprehensive patient information, accessible to authorized healthcare providers in real-time.

Health Information Exchange: Platforms that allow seamless sharing of patient information among different healthcare providers and systems.

Telemedicine and Telehealth: Use of telecommunication and information technology to provide remote healthcare services,

Connected Medical Devices: Devices such as wearable sensors, monitoring equipment, and infusion pumps that collect and transmit real-time patient data for monitoring and analysis.

Remote Patient Monitoring: Continuous monitoring of patients outside the traditional healthcare setting using IoT devices to manage chronic conditions and post-operative care.

Predictive Analytics: Analysing historical patient data to predict disease outbreaks, patient readmissions, and optimize resource allocation.

Robotic Surgery: Use of robotics for surgical procedures, rehabilitation, medication dispensing, and other healthcare tasks to enhance precision and efficiency.

Automation: Automated systems are used for inventory management, pharmacy operations, and logistics within the hospital.

Fact Zone

AI can deliver 16 percent Global GDP growth by 2030.

SMART EDUCATION

Smart education is referred to as digital education or e-learning. It involves the integration of advanced technologies to enhance and optimize the learning process. These technologies aim to provide personalized and interactive learning experiences, improve accessibility, and facilitate more effective teaching and learning methods.

Smart education aims to make learning more flexible, personalized, and efficient, catering to the diverse needs of today's learners and preparing them for an increasingly digital and interconnected world.

Virtual Learning Environments: Online spaces where students can access course materials, participate in discussions, and collaborate on projects.

Virtual Classrooms: Real-time online classrooms are these with video conferencing, screen sharing, and collaboration features.

Online Courses and Degrees: Degree programs or individual courses are offered online, providing flexibility for learners to study at their own pace.

Blended Learning: A combination of traditional classroom instruction and online learning are used allowing students to access resources and engage in activities both in person and digitally.

Mobile Apps and Platforms: Educational apps and mobile-friendly websites are used that enable learning on smartphones and tablets, making education more accessible and convenient.

Virtual Reality (VR) and Augmented Reality (AR): VR and AR technologies are used that create interactive and immersive educational experiences, that is particularly useful in fields like science, healthcare, and engineering.

Chatbots and Virtual Assistants: AI-powered chatbots provide instant support to students, answering questions and offering guidance.

Experiential Learning

Imagine you are a teacher, now take topic of your choice and create a special e-learning course. What advanced technologies would you use to make the learning experience fun, interactive, and personalized for each student?

_____

_____

SMART CITIES

Smart cities are urban areas that integrate advanced technologies, data-driven solutions, and digital innovations to enhance the quality of life, sustainability, efficiency, and overall urban governance for their residents and visitors. These cities leverage various interconnected systems to optimize resources, improve infrastructure, reduce environmental impact, and enhance citizen engagement.

The goal is to enhance the overall quality of life for residents while addressing urban challenges and promoting sustainability for the future.

Connected Devices and Sensors: IoT-enabled sensors and devices integrate into various aspects of urban infrastructure to collect and analyze data, enabling informed decision-making.

Intelligent Traffic Management: Traffic monitoring and management systems are used to optimize traffic flow, reduce congestion, and enhance road safety.

Smart Grids: Advanced electrical grids are used that optimize energy distribution, reduce energy waste, and integrate renewable energy sources effectively.

Energy-Efficient Buildings: Buildings equipped with energy management systems are these with smart lighting, and energy-efficient appliances to reduce energy consumption.

Waste Management Optimization: IoT-enabled waste bins and management systems are used to optimize waste collection routes, reduce litter, and improve recycling efforts.

Green Spaces and Environmental Monitoring: Integration of green spaces and environmental sensors is these to monitor air and water quality, contributing to a healthier urban environment.

Digital Platforms for Citizen Feedback: Mobile apps and online platforms are used for citizens to report issues, provide feedback, and engage with local government.

Telemedicine and Remote Healthcare Services: Remote healthcare solutions and telemedicine services are used to improve healthcare accessibility and reduce the burden on healthcare facilities.

Public Safety Technologies: Surveillance systems, emergency response systems, and data analytics are used to enhance public safety and emergency response times.

Digital Identity and e-Government Services: Secure digital identification systems and online platforms are used for various government services, enabling streamlined access for citizens.

Spot Check

Write T for true and F for false.

1. VMS include digital signs that display real-time traffic information. _____
2. Blended Learning is a combination of traditional classroom and online learning. _____
3. Fairness ensure the AI systems can discriminate against individuals or groups. _____

AI ETHICS

AI ethics refers to the moral principles, guidelines, and values that govern the development, deployment, and use of artificial intelligence (AI) systems.

AI ethics is an evolving field that requires ongoing dialogue, research, and cooperation among governments, industries, academia, and civil society to develop guidelines and frameworks that promote responsible and ethical AI development and deployment.

Fairness: Ensuring AI systems do not discriminate against individuals or groups based on characteristics like race, gender, ethnicity, or socioeconomic status.

Bias Mitigation: AI systems strive to minimize biases in AI algorithms and data that can lead to unfair or discriminatory outcomes.

Transparency: AI systems and their decision-making processes are used understandable and accessible to users, regulators, and stakeholders.

Privacy Preservation: Individuals' personal information is safeguarding and ensuring that AI systems ensure respect privacy norms and regulations.

Human Rights Consideration: AI systems are designed to enhance human well-being, autonomy, and empowerment.

Public Involvement: Involving diverse stakeholders, including the public, in AI development, policy-making, and deployment to incorporate a variety of perspectives and concerns.

Collaboration and Interdisciplinary Approaches: Encouraging collaboration among different disciplines, including ethics, law, technology, and social sciences, to address complex AI challenges.

Fact Zone

AI powered automotive market is expected to grow up to 35 percent by 2026.

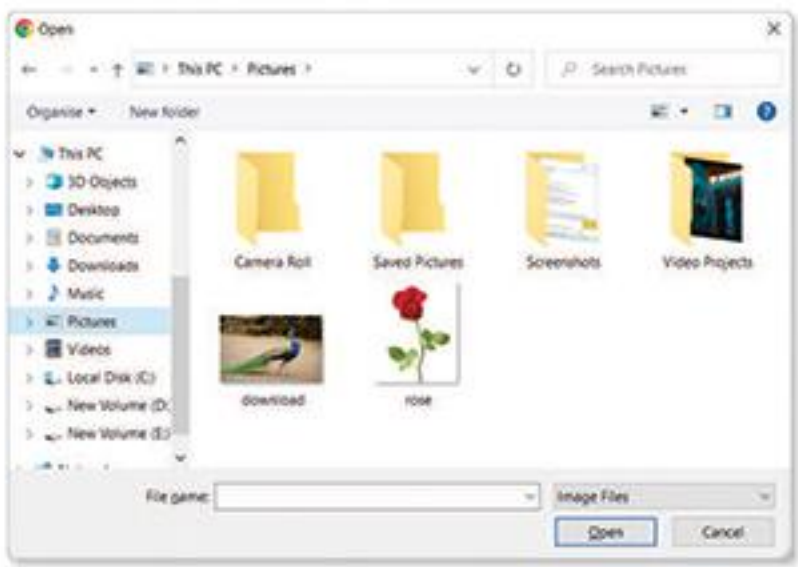
AI GAME- EVEN STRANGER THINGS

To play game open link https://evenstranger.pw/ and click on the **"Let's play"** button on the screen.

Now follow the given steps:

1. Click on the Upload an image option from the screen.

2. An Open dialog box will open on the screen. Navigate the folder.



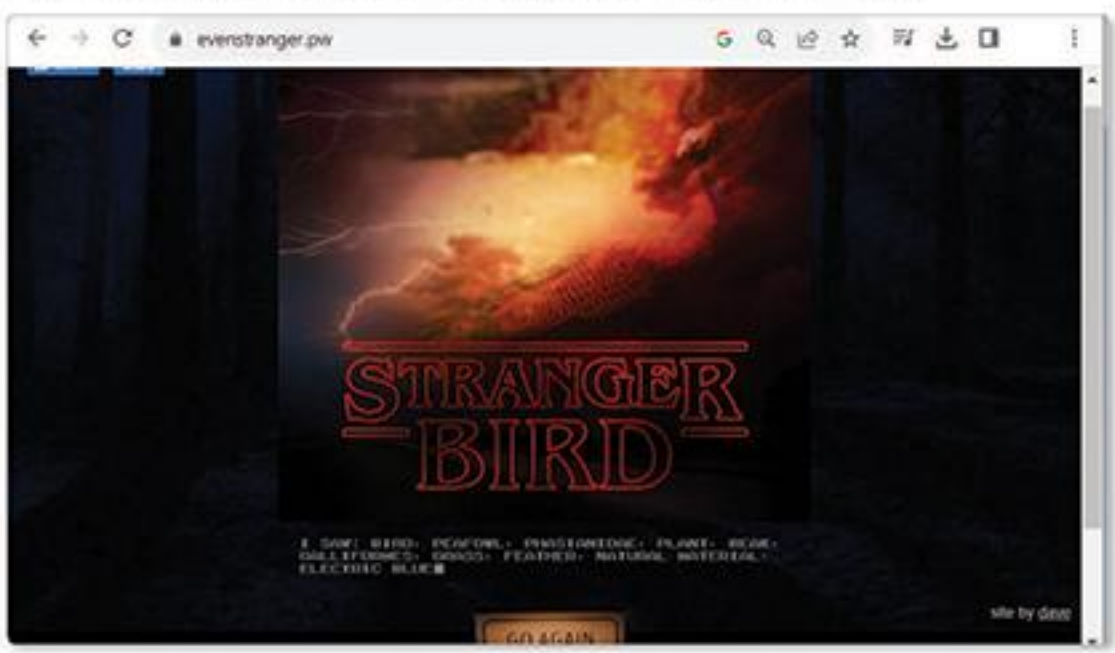
3. Choose the desired picture and click on the Open button.
4. Image will upload on the screen and will show all the details.

Practical Tip

AI Games are played online, so be sure to verify your internet connection before starting to play these games.

everstranger.pw
EVEN
STRANGER
THINGS
THIS SITE USES AI TO UNDERSTAND WHAT'S IN YOUR PHOTO, THEN MAKES A STRANGE POSTER OUT OF IT.
site by dave

5. Now screen will shows all the details & features of uploaded image.



Fact Zone

The global AI market is predicted to snowball in the next few years, reaching a $190.61 bilion market value in 2025.

Google-It

Which is the first AI game?

In Summary

- The concept of a smart home has evolved significantly over the years.
- A smart highway integrates advanced technologies like sensors, cameras, and communication systems.
- Smart hospitals, also known as intelligent or digital hospitals, are healthcare institutions that leverage advanced technologies.
- Smart education is referred to as digital education or e-learning.
- Smart cities are urban areas that integrate advanced technologies, data-driven solutions, and digital innovations.
- AI ethics refers to the moral principles, guidelines, and values that govern the development, deployment, and use of artificial intelligence (AI) systems.

EXERCISES

A. Think and Tick (✓) the correct options.

1. Which of the following device optimize heating and cooling as per need and schedules?

   a. Smart Thermostats ☐ b. Smart Lighting ☐ c. Smart locks ☐

2. Which of the following device detect motion, smoke, carbon monoxide?

   a. Smart Thermostats ☐ b. Smart Sensors ☐ c. Smart locks ☐

3. It includes navigation systems that provide real-time traffic updates.

   a. Dynamic Route ☐ b. Static Route ☐ c. Local Route ☐

4. It involves the integration of advanced technologies to enhance and optimize the learning process.

   a. Smart Thermostats ☐ b. Smart Lighting ☐ c. Smart education ☐

5. _____ are urban areas that integrate advanced technologies, data-driven solutions, and digital innovations.

   a. Smart Thermostats ☐ b. Smart Sensors ☐ c. Smart cities ☐

B. Fill in the blanks.

Hints Smart hospitals, Course materials, AI-powered chatbots, Home appliances, Automated Toll Collection, Smart homes

1. _____ aim to improve daily life and make it easy.
2. _____ uses RFID and other technologies to streamline toll payment processes and reduce traffic congestion.
3. _____ be controlled and monitored remotely for increased efficiency and convenience.
4. _____ also known as intelligent or digital hospitals.
5. Online spaces is a place where students can access _____ .
6. _____ provide instant support to students, answering questions and offering guidance.

C. Answer the following questions.

1. What do you mean by Smart sensor and detector?

_____

_____

2. What is the aim of e-learning?

_____

_____

3. What do you mean by robotic surgery?

_____

_____

4. What are the virtual class rooms?

_____

_____

5. Write any three points about smart highway.

_____

_____

6. What are the digital hospitals?

_____

_____

_____

7. Explain the concept of smart home in detail.

Brain Test

Critical Thinking, Computational Thinking

A. Find six terms related to AI

N	S	M	A	R	T	H	O	M	E	Z	G	F	D	C	N	F	C
S	M	A	R	T	H	I	G	H	W	A	Y	X	Z	H	A	X	O
D	A	N	C	E	R	Z	X	T	Y	V	F	U	D	A	V	K	M
I	R	W	Q	A	S	R	M	Q	E	X	D	F	G	B	I	J	P
M	T	Q	W	E	E	T	R	E	W	Q	R	T	T	O	G	I	U
V	C	H	A	T	B	O	T	S	G	Y	T	A	N	T	A	Z	T
C	I	R	R	U	Y	U	C	X	Z	A	T	T	R	E	T	X	E
P	T	A	S	M	A	R	T	S	E	N	S	O	R	S	I	N	R
X	Y	U	I	Q	W	Z	X	C	V	B	W	E	R	T	O	U	O
R	E	P	L	E	A	A	P	O	E	X	R	N	I	N	N	Z	N

B. Look at the given pictures and write their uses.

In the Lab

Digital Literacy

Visit your computer lab and do the following.:

1. Open Google and search about AI Ethics.
2. Make a presentation on the collected information,
3. Add relevant pictures also.

Teacher's Note

1. Explain the concept of smart home and smart hospitals.
2. Discuss how smart city is beneficial to us.
3. Discuss AI ethics with the students.

Worksheet 2

(Based on chapters Chapter 6 to 9)

A. Write HTML Codes to create similar webpage.

Show Checkboxes

- ☐ Tshirt
- ☐ Jeans
- ☐ Shirt
- ☐ Trousers

Submit

B. Identify the syntax and write the name and draw flowchart for this.

Syntax:

if condition:

statements(s)

else:

statements(s)

Name:

Flowchart:

C. Write the output of the given Python codes.

i.

```
for number in range(1, 10):
    if number == 5:
        continue
    print(number)
```

Output:

ii.

```
#combining else with while
count = 0
while (count<5):
    count=count+1
    print("Hello python")
else:
    print("Python language")
```

Output:

D. Write the purpose of the following in Python:

1. Initialization _____
2. Condition _____
3. Iteration _____
4. Arguments _____
5. Return value _____
6. lower() _____

E. Define in the following:

1. Smart Lighting Systems

_____

2. Automated Toll Collection

_____

3. Self-healing Material

_____

4. Virtual Classrooms

_____

5. Energy-Efficient Buildings

_____

5. The if statement is not a conditional statement in Python. _____
6. Python is an object-oriented and interpreted language. _____
7. The concept of a smart home has evolved significantly over the years. _____
8. Python uses triple quotes to write multi-line strings. _____
9. The if-elif-else statement allows us to handle multiple conditions sequentially. _____
10. Operators are special symbols or characters. _____

C. Fill in the blanks.

1. The src attribute is used to define _____ that should be loaded into the frame.
2. The _____ attribute is used to define the width of border of each frame.
3. The _____ tag creates a little box on a webpage where you can show another webpage inside it.
4. The _____ element is used to define a caption for field set elements.
5. The _____ element specifies audio files in a variety of formats for the browser to select from.
6. The print() function is used to show the _____ which is entered by the user.
7. The _____ are the reserved words that have predefined meaning.
8. Python has large _____ and supporting tools to make task easy.
9. The _____ is used for empty control statements, functions, and classes.
10. A function _____ should be unique and related to the task it will perform.

D. Answer the following questions.

1. What is the use of framespacing attribute?
2. Define any two attributes of input element under the form.
3. Differentiate between marginwidth and marginheight attributes.
4. What are the data types?
5. What is the use of a pass statement?
6. What is string?
7. Define the loop and write its syntax also.
8. What do you mean by Smart sensor and detector?
9. What are the virtual class rooms?
10. Write any three points of smart highway.

Indian Heritage

SOCIAL ACTIVIST AND REFORMER

Time and again, social activists and reformers have made great efforts towards the abolition of social evils and drawbacks. All of them have played a very important role in making India a progressive nation of liberated people.

Let us read about some famous social activists and reformers from India.

Raja Ram Mohan Roy was the founder of the Brahmo Samaj that was set up to fight against the social evils. He raised a voice against practices such as Sati, idolatry, and polygamy. He also campaigned for causes such as widow remarriage, the right of women to hold property, and the right of women to education.

Swami Dayanand Saraswati was the founder of the Arya Samaj, he preached egalitarianism as opposed to the widespread casteism prevalent in the society. He encouraged the study of the sciences and technology. He promoted the equality of all human beings, whether rich or poor, or men or women. He preached his teachings through his book Satyarth Prakash.

Gopal Krishna Gokhale along with Mahadev Govind Ranade established the 'Servants of India Society' with the objective of training people to devote themselves to the service of India as national missionaries. The organization helped victims of floods and famines, and made efforts to educate women.

Swami Vivekananda is regarded as a patriotic saint of modern India, and his birthday is celebrated as National Youth Day.

Acharya Vinoba Bhave actively participated in India's freedom struggle. During the post-independence era he started social reform movements such as the Bhoodan (Gift of the Land) Movement and the Sarvodaya Movement.

Keshab Chandra Sen was given the title of 'Acharya' of the 'Brahmo Samaj' and was associated with many revolutionary programs such as the liberation of women, education of women and poor workers, and the eradication of social evils such as untouchability and casteism. He used the medium of Press to spread social consciousness. In 1861, he started a fortnightly journal 'Indian Mirror'.

Aurobindo Ghose evolved a new method of spiritual practice, which he called the Integral Yoga. The practice focusses on spiritual realization. In 1926, with the help of his spiritual collaborator, the Mother, he founded an Ashram.

Search...

Create project file on these personalities. Add information and pictures of each personality.

Project

EXCEL

1. Enter the following data that contains monthly sales data for a year.

N10

	A	B	C	D	E	F	G	H
1	Month	Product	Target	Sale	Revenue			
2	January	Soap	70	40				
3	February	Ditergent	90	50				
4	March	Shampoo	85	30				
5	April	Creame	75	25				
6	May	Conditioner	60	55				
7	June	Body wash	80	65				
8	July	Sugar	90	80				
9	August	Tea	95	70				
10	September	Coffee	30	90				
11	October	Slat	25	85				
12	November	Oil	55	75				
13	December	Spices	65	60				

- Create a line chart to visualize the sales trend over the months.
- Label the axes appropriately and provide a suitable title for the chart.
- Given the quarterly revenue data for a company for the past two years.
- create a clustered bar chart to compare the revenue of each quarter for the year.
- Format the chart appropriately with different colors for each year and a legend.

2. Visit an ice cream parlor and collect the data on favorite ice cream flavors for a group of people. Create a pie chart to represent the distribution of each flavor. Ensure that the chart is labeled with the flavor names and the corresponding percentages.

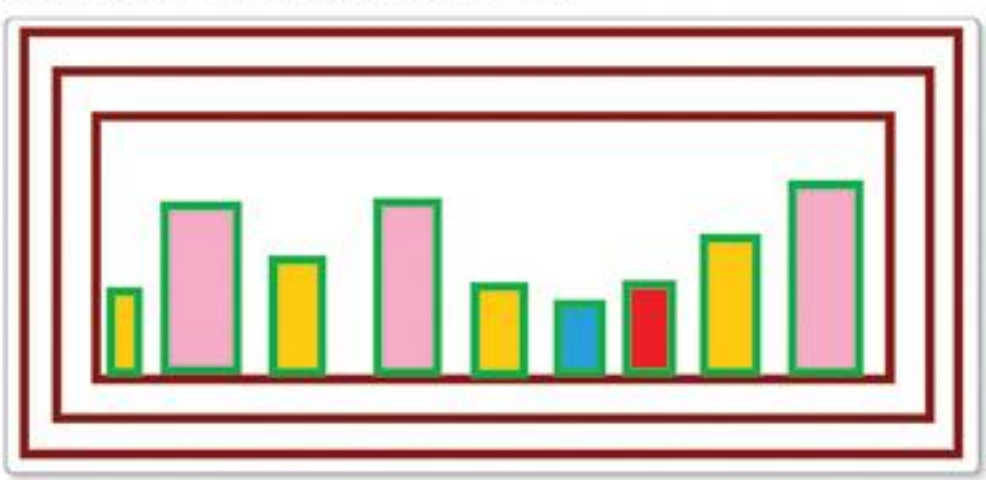
3. Enter the following data that is based on the monthly electricity consumption data for a household over one year.

	A	B
1	**Electricity Consumption for a year**	
2	**Month**	**Electricity Consumption**
3	January	200 Unit
4	February	300 Unit
5	March	250 Unit
6	April	400 Unit
7	May	550 Unit
8	June	220 Unit
9	July	640 Unit
10	August	230 Unit
11	September	800 Unit
12	October	700 Unit
13	November	750 Unit
14	December	840 Unit

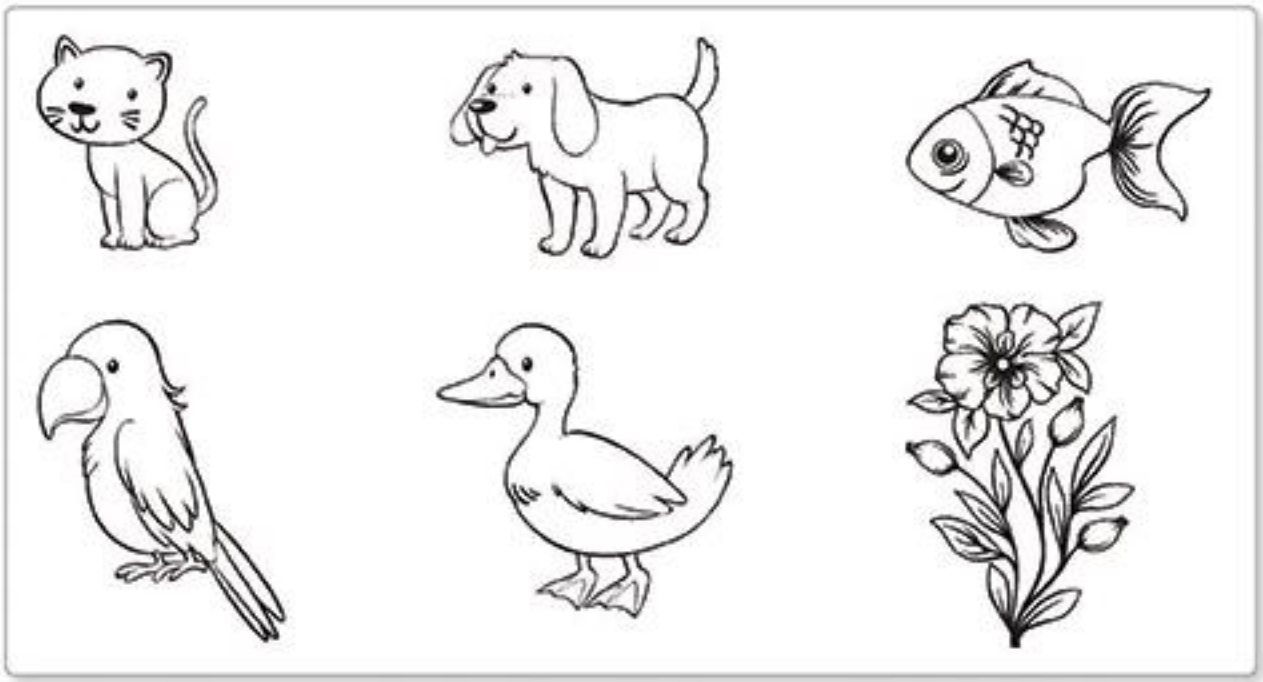
- Create an area chart to visualize the consumption of electricity.
- Now change the type of chart

KRITA

1. Draw the following pattern using shapes tools in Krita:



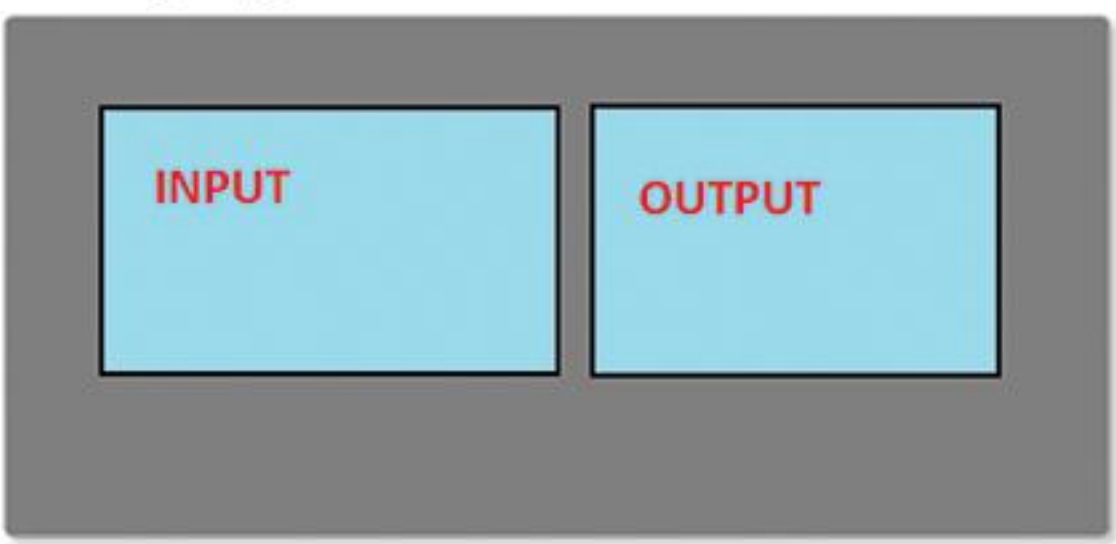
2. Draw the following objects in Krita and also fill their original colours.



3. Create an animation to chase an apple frequently. Also use keyframes to create animation and run the animation in slow speed.

HTML

1. Create the following webpage in HTML:



2. Create the following form in HTML:

3. Create a similar registration Form in HTML:

PYTHON

- Write a Python program that uses a for loop to iterate through the list. For each number, print the number if it is even, and print "Odd" if it's an odd number.
- Write a Python program that uses a for loop to iterate through the characters of the string and prints each character along with its index.
- Write a Python program to calculate the sum of all the elements in the list using a loop.
- Write a Python program that generates and prints the Fibonacci sequence up to a specified number of terms using a while loop.

0 1 1 2 3 5

```
0 + 1 = 1
    1 + 1 = 2
        1 + 2 = 3
            2 + 3 = 5
```

- Write a Python program that calculates the sum of all numbers from 1 to a given positive integer 'n'.
- Write a Python program to convert your name in lowercase.
- Write a Python program to calculate the length of your school name.
- Write a program to create the given patterns in Python.

```
1
22
333
4444
55555
```

```
*
**
***
****
*****
```

Sustainable Development Goals

The Sustainable Development Goals (SDGs) are like a worldwide plan to make the world better. They were made by the United Nations in 2015 and include 17 goals that are all connected. These goals help us solve big problems like poverty and protecting the Earth. In this chapter, we'll talk about why the SDGs are important, where they came from, and how they're making the world a fairer and safer place.

The 17 SDGs are like big goals that cover lots of things like helping people, making money fair, and taking care of our planet. Each goal is about solving a big problem in the world, and when we work on all of them together, it's like having a plan to make the world better, fairer, and richer for everyone by 2030. Let's learn about them.

1. No Poverty: End poverty in all its forms everywhere.

This goal aims to eradicate extreme poverty by ensuring that all people, especially those in vulnerable situations, have equal rights to economic resources and access to basic services.

2. Zero Hunger: End hunger, achieve food security, and promote sustainable agriculture.

The goal is to ensure that everyone has access to sufficient, safe, and nutritious food, and to promote sustainable farming practices to safeguard food security for future generations.

3. Good Health and Well-being: Ensure healthy lives and promote well-being for all.

This goal seeks to ensure access to quality healthcare services, reduce maternal and child mortality, and combat diseases such as HIV/AIDS, malaria, and other communicable diseases.

4. Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

The aim is to provide inclusive and quality education, ensuring that all children and adults have access to lifelong learning opportunities to acquire knowledge and skills.

5. Gender Equality: Achieve gender equality and empower all women and girls.

This goal advocates for the elimination of gender-based discrimination and violence and the promotion of equal rights and opportunities for women and girls in all areas of life.

6. Clean Water and Sanitation: Ensure the availability and sustainable management of water and sanitation for all.

The objective is to provide access to clean and safe drinking water and adequate sanitation facilities, as well as to promote efficient and sustainable water use.

7. Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable, and modern energy for all.

This goal focuses on expanding access to clean and renewable energy sources while promoting energy efficiency and sustainability.

8. **Decent Work and Economic Growth: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.**

The aim is to create economic opportunities, promote job creation, ensure fair working conditions, and stimulate entrepreneurship and innovation.

9. **Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.**

This goal encourages the development of infrastructure, innovation, and industry to drive economic growth while ensuring sustainability and inclusivity.

10. **Reduced Inequality: Reduce inequality within and among countries.**

This goal strives to reduce income inequality, promote the social, economic, and political inclusion of all, and ensure that no one is left behind.

11. **Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient, and sustainable.**

The objective is to create sustainable and inclusive urban environments that provide basic services, housing, transportation, and protection against disasters.

12. **Responsible Consumption and Production: Ensure sustainable consumption and production patterns.**

This goal promotes sustainable resource management, waste reduction, and responsible consumption to minimize environmental impacts.

13. **Climate Action: Take urgent action to combat climate change and its impacts.**

This goal emphasizes the need to mitigate and adapt to climate change, reduce greenhouse gas emissions, and strengthen resilience to climate-related disasters.

14. **Life Below Water: Conserve and sustainably use the oceans, seas, and marine resources.**

The aim is to protect marine ecosystems, combat overfishing, and reduce marine pollution to ensure the health of oceans and coastal areas.

15. **Life on Land: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.**

This goal focuses on conserving biodiversity, preventing land degradation, and promoting sustainable land management practices.

16. **Peace, Justice, and Strong Institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.**

The goal seeks to strengthen governance, promote the rule of law, ensure access to justice, and reduce violence and corruption.

17. **Partnerships for the Goals: Strengthen the means of implementation and revitalize the global partnership for sustainable development.**

The final goal emphasizes the importance of collaboration among governments, the private sector, civil society, and other stakeholders to achieve the SDGs. It encourages the sharing of knowledge, technology, and resources to accelerate progress.

ROLE OF AI IN SDG GOALS

While AI holds immense potential for advancing the SDGs, it is essential to address ethical and governance challenges, such as bias in AI algorithms, data privacy concerns, and the digital divide, to ensure that the benefits of AI are equitably distributed and aligned with the SDGs' principles of leaving no one behind. Additionally, international cooperation and partnerships are crucial to harness the full potential of AI in achieving these global sustainability goals.

1. Poverty Reduction (SDG 1): AI can help identify poverty-stricken areas by analysing satellite imagery, enabling targeted aid distribution and development programs.

2. Hunger Eradication (SDG 2): AI-powered precision agriculture and predictive analytics assist farmers in optimizing crop yields and reducing food waste, contributing to food security.

3. Health and Well-being (SDG 3): AI aids in disease detection, diagnosis, and treatment by analysing medical data, improving healthcare access and quality. Chatbots and telemedicine services also expand healthcare reach.

4. Quality Education (SDG 4): AI supports personalized learning through adaptive educational platforms, making education more accessible and effective.

5. Gender Equality (SDG 5): AI can help detect and mitigate gender bias in various domains, including hiring processes and language translation tools.

6. Clean Water and Sanitation (SDG 6): AI assists in managing and optimizing water distribution systems to ensure clean and efficient water supply.

7. Affordable and Clean Energy (SDG 7): AI-driven energy management systems enhance energy efficiency and promote renewable energy adoption.

8. Decent Work and Economic Growth (SDG 8): AI enables more efficient job matching, enhances workforce productivity, and supports economic growth through automation and innovation.

9. Industry, Innovation, and Infrastructure (SDG 9): AI fosters innovation by automating research processes, optimizing supply chains, and advancing infrastructure management.

10. Reduced Inequality (SDG 10): AI can help identify patterns of inequality and discrimination, allowing policymakers to design targeted interventions.

11. Sustainable Cities and Communities (SDG 11): AI contributes to urban planning, traffic management, and infrastructure development, making cities more sustainable and efficient.

12. Responsible Consumption and Production (SDG 12): AI-powered analytics monitor and optimize resource consumption, promoting sustainable production and consumption patterns.

13. Climate Action (SDG 13): AI assists in climate modelling, weather forecasting, and the analysis of climate-related data to develop strategies for mitigating climate change.

14. Life Below Water (SDG 14) and 15: Life on Land (SDG 15): AI helps monitor and protect ecosystems by analysing data from remote sensors, satellite imagery, and drones, aiding in conservation efforts.

16. Peace, Justice, and Strong Institutions (SDG 16): AI is used in legal analytics and crime prediction to enhance public safety and improve the efficiency of legal processes.

17. Partnerships for the Goals (SDG 17): AI facilitates data sharing, collaboration, and coordination among governments, organizations, and stakeholders to accelerate SDG progress.

PROGRESS AND CHALLENGES

Since their adoption in 2015, countries and organizations around the world have made significant strides in pursuing the SDGs. However, numerous challenges remain:

Inequality: Reducing inequality both within and among countries is an ongoing challenge, with disparities in income, access to healthcare, and educational opportunities persisting.

Environmental Sustainability: Achieving environmental sustainability, especially in the face of climate change, remains a formidable task.

Global Partnerships: Strengthening global partnerships and cooperation is essential for achieving the SDGs, but geopolitical tensions and protectionist policies have at times hindered progress.

SDG GAME

The "SDG game" typically refers to a board game or simulation designed to educate players about the Sustainable Development Goals (SDGs) and the challenges of sustainable development. While the specific rules of such a game may vary depending on the design, here are some general guidelines that might apply to playing an SDG game:

Objective: The objective of the game is to promote understanding of the SDGs, the interconnectedness of global issues, and the need for sustainable solutions.

Components: SDG games usually include a game board, playing pieces, cards, and other components relevant to the game's theme.

Setup: Set up the game board and distribute playing pieces to each player or team. Shuffle any decks of cards and place them face down.

Turns: Players take turns, usually in a clockwise order.

Movement: Advance your playing piece on the board according to the game's rules. This could involve rolling dice, drawing cards, or following specific instructions.

Challenges: Players encounter challenges or scenarios related to the SDGs as they progress. These challenges may involve answering questions, making decisions, or solving problems related to sustainable development.

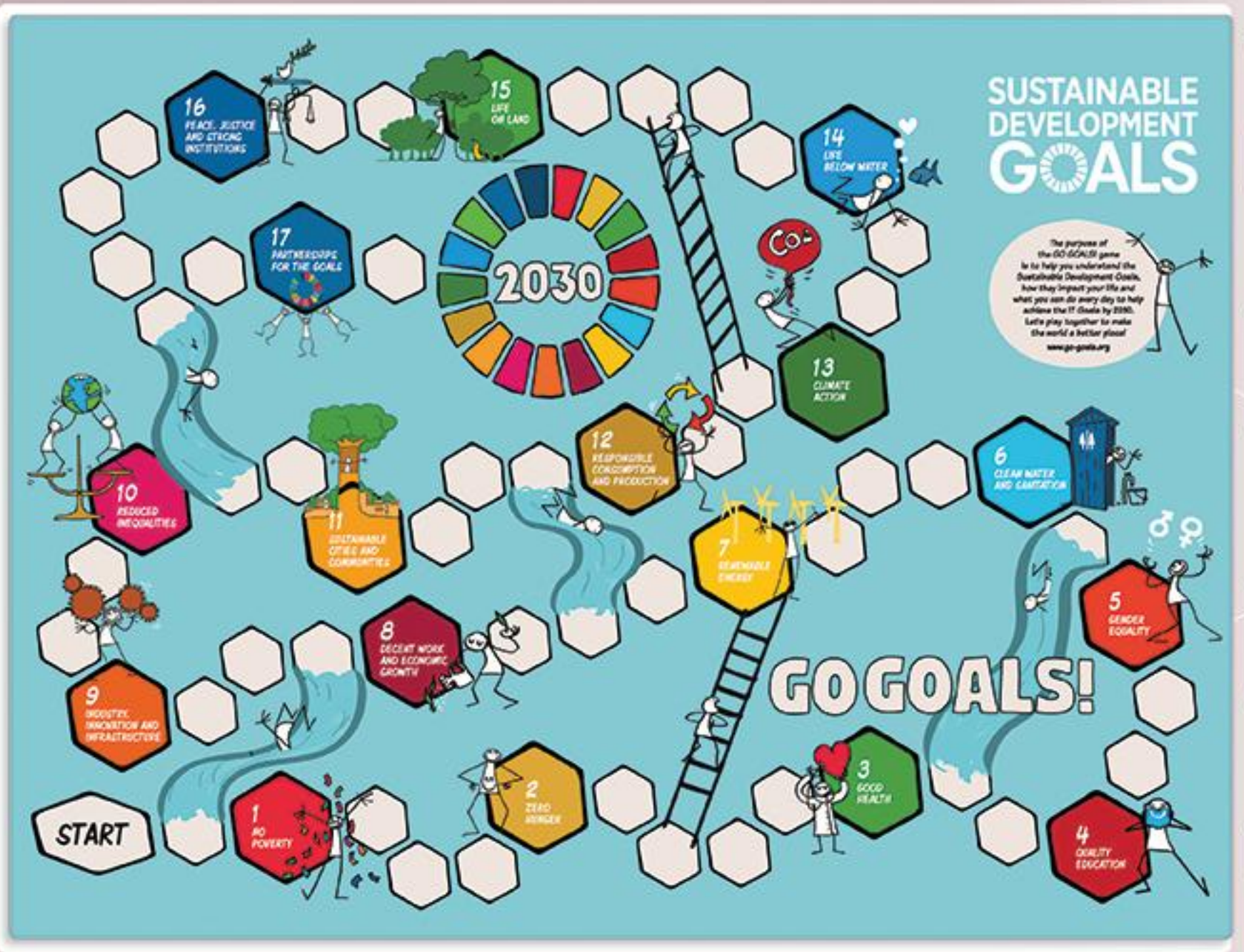
Decision-Making: Players often face choices that affect their progress in the game and the achievement of SDG-related objectives. These decisions are designed to simulate the real-world trade-offs and dilemmas involved in sustainable development.

Resource Management: Depending on the game, players might need to manage resources or assets, such as finances or natural resources, to advance toward their SDG-related goals.

Collaboration: Some SDG games encourage collaboration among players or teams to achieve shared goals, emphasizing the importance of international cooperation in addressing global challenges.

Scoring: Games may include a scoring system to track players' progress in achieving SDGs. Scoring could be based on specific objectives, points gained or lost during challenges, or other criteria.

Winning: The primary goal of an SDG game is typically to promote learning and understanding rather than competitive victory. However, some games might have a winning condition, such as accumulating the most points or successfully achieving a set of SDGs.


SUSTAINABLE DEVELOPMENT GOALS
GO GOALS!
2030
START
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
CO2
The purpose of the GO GOALS! game is to help you understand the Sustainable Development Goals, how they impact your life and what you can do every day to help achieve the 17 Goals by 2030. Let's play together to make the world a better place!
www.go-goals.org

SOF National Cyber Olympiad Sample Questions

PATTERN & MARKING SCHEME			
Section	(1) Logical Reasoning	(2) Computers & IT	(3) Achievers Section
No. of Question	10	35	5
Marks per Question	1	1	3

SYLLABUS

Section-1: Verbal and Non-Verbal Reasoning.

Section-2: Fundamentals of Computers, Algorithms & Flowcharts (Advanced symbols), Internet & Viruses, HTML & CSS [Html, Head, Title, Body (Attributes: Background, Bgcolor, Text, Link, Alink, Vlink), Font (Attributes: Color, Size, Face), Center, BR, HR (Attributes: Size, Width, Align, Noshade, Color), Comment tag(<!-- -->), <H1>..<H6>, <P>, <B>, <I>, <U>, <IMG>, Html Elements: A, Ul and Ol (Attributes: Type, Start), Li], Flash CS6, MS-Access, Networking, MS-Word (Exploring File tab, Language and Translate options, Tracking features -Comments, Reviewing Pane, Tracking Changes, Comparing, Combining and Protecting documents, Working with References), MS-PowerPoint (Exploring File tab and Slide Show tab, Comparing, Combining and Protecting presentations), MS-Excel(Exploring File tab, Useful Formulas and Functions - IF,Even, Odd, LCM, GCD, Power, Product, Round, Sqrt, Sum, Min, Max, Average, Count, Upper, Lower And Replace, Cell referencing, Using Defined Names group), Memory & Storage Devices, Number System (Introduction), Basics of Cyber Crimes, Cyber Laws, Operating Systems(Introduction, Features, Types-single user and multi-user), Latest Developments in the Field of IT.

Section-3: Higher Order Thinking Questions - Syllabus as per Section – 2.

Questions are based on Windows 10 and MS-Office 2016.

LOGICAL REASONING

1. Select the correct mirror image of the given word, if the mirror is placed vertically to the right.

L e O P A r D

(A) ꓷ ɿ A ꟼ O ɔ L (B) ꓷ ɿ A ꟼ O ɔ ƚ

(C) ꓷ ɿ A ꟼ O ɔ ƚ (D) ꓷ ɿ A ꓷ O ɔ ƚ

2. Select a figure from the options, which satisfies the same condition of the placement of the dots as in Fig. (X).

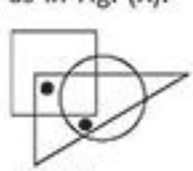
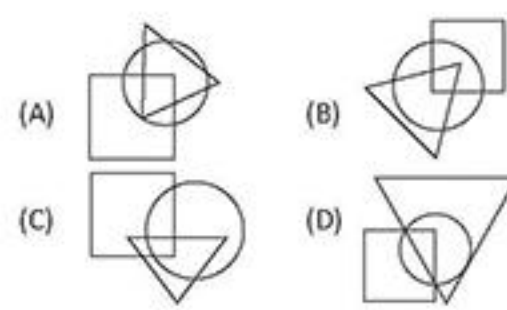


Fig. (X)



2. How many 7s are there in the following series which are preceded by even number and followed by odd number?

a8 7 6 7 8 6 7 5 6 7 9 7 6 1 6 7 7 6 8 8 6 9 7 6 8 7

(A) None (B) One

(C) Two (D) Three

4. Which of the following is NOT available as a category in Control Panel of Windows 10?
   (A) System and Security
   (B) Network and Internet
   (C) Bluetooth Settings
   (D) Ease of Access

5. The function of given icon in MSWord 2016 is _____.

   (A) To mark the document as final
   (B) To insert an index into the document
   (C) Merge document to PDF files
   (D) Insert Flash video

6. CSS is used to style an HTML document. Here, CSS stands for _____.
   (A) Computer Style Sheets
   (B) Combined Sheet Styles
   (C) Common Sheet Styles
   (D) Cascading Style Sheets

7. Which of the following number system contains just two digits 0 and 1?
   (A) Binary (B) Decimal
   (C) Octal (D) Hexadecimal

8. Which of the following is the CORRECT way to access Rehearse Timings feature in MS-PowerPoint 2016?
   (A) Slide Show tab → Set Up group → Rehearse Timings
   (B) Review Tab → Slide group → Rehearse Timings
   (C) Setup tab → Timings group → Rehearse
   (D) Slide show tab → Timings group → Rehearse

ACHIEVERS SECTION

9. Which of the following statements hold(s) true about telnet?
   Statement 1 : It allows to connect to remote computers.
   Statement 2 : It only allows to buy and sell online products.
   (A) Only Statement 1
   (B) Only Statement 2
   (C) Both Statement 1 and Statement 2
   (D) Neither Statement 1 nor Statement 2

10. Select the INCORRECT statement(s) about single user operating system.
    (A) It is useful for a computer intended to run multiple users at once.
    (B) It is used by only one user at a time.
    (C) Both (A) and (B)
    (D) None of these

ANSWERS

1. (B) 2. (C) 3. (D) 4. (C) 5. (A) 6. (D) 7. (A) 8. (A) 9. (A) 10. (A)

360 Degree Holistic Progress Card

STUDENT'S NAME: _____ DATE OF BIRTH: _____

CLASS: _____ SECTION: _____ ROLL NUMBER: _____ ACADEMIC YEAR: _____

CLASS TEACHER'S NAME: _____ PARENT'S NAME: _____

SIGNATURES

PARENT: _____ CLASS TEACHER: _____

PRINCIPAL: _____ TEACHER'S SUGGESTIONS: _____

Learning Outcome	Self-assessment		Peer-assessment		Teacher-assessment	
Learning Outcome	can do this	need some help	can do this	need some help	can do this	need some help
Chapter 1: Computer Networking						
Chapter 2: Charts in Excel						
Chapter 3: Layers in Krita						
Chapter 4: Animation in Krita						
Chapter 5: Latest IT Trends						
Chapter 6: Frame and Forms in HTML5						
Chapter 7: Conditions in Python						
Chapter 8: Loops in Python						
Chapter 9: Future of AI						

Think Digitally

On a technology Trek...

Think Digitally is a series of 8 books based on Windows 10 and MS Office 16 to make the learning experience interactive and hands-on for the young learners. It is based on New Education Policy 2020 and the learning outcomes as laid out by the CBSE.

FEATURES

- LEARNING OUTCOMES
- WARM UP
- LEARN ABOUT
- SPOT CHECK
- IN SUMMARY
- GOOGLE-IT
- FACT ZONE
- GO & RESOLVE
- KEYBOARD SHORTCUT
- WORKSHEETS
- TEST PAPERS
- SOF NATIONAL CYBER OLYMPIAD

NEP COMPLIANT

- EXPERIENTIAL LEARNING
- COMPETENCY BASED QUESTION
- ACTIVITIES
- PROJECTS
- LIFE SKILLS, VALUES
- HERITAGE POINT
- WEBQUEST
- BRAIN STORMING
- BRAIN TEST
- IN THE LAB

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